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June 15, 1964

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A 'Little Black Box' Helps Railroads Ease Firemen Off Trains

* * *

Device Employs New Technique To Stop Train Automatically If Engineer Is Incapacitated

By John D. Williams
Staff Reporter of The Wall Street Journal

A $600 "little black box" is helping railroads ease $2.75-an-hour firemen out of locomotive cabs around the country.

Not that the firemen are surrendering meekly to the electronic device or giving in gracefully to railroad managements anxious to lay them off. Witness last week's wildcat strikes on several lines. The walkouts were touched off as railroads began the gradual elimination of thousands of firemen in yard and freight service.

In the midst of this battle over "featherbedding," a hot demand is developing for the Alertor, as the electronic device is called. The railroads see it as another weapon in their argument with the unions over the safety issue of what happens when an engineer is suddenly incapacitated, and there's no fireman on hand to bring the train to a stop.

The Alertor is designed to set the brakes automatically 30 seconds after an engineer is incapacitated. There's nothing new about "dead-man controls," of course. But adherents of the Alertor claim it offers advantages over pneumatic controls which have been used for years and which trip the brakes when an engineer fails to maintain pressure on a foot pedal or a throttle.

Big Orders Placed

Vapor Corp. of Chicago sold its first Alertor only about a year ago to the Great Northern Railway. Today, 35 lines have ordered a total of 968 devices. The big bulk of orders has come since Nov. 26, the date the Federal arbitration board ruled that roads could gradually eliminate most firemen on freight and yard engines. The board said, however, that yard engines must have a "dead-man control" if the firemen were eliminated.

Because most switch engines used in rail yards had no dead-man controls, the Alertors thus far have been going into these engines for the most part. But they are beginning to find their way into the cabs of regular freight and passenger trains too.

Essentially, the Alertor consists of a box mounted above the windshield in front of the engineer and a system of wires from that box to an antenna inside the leather seat on which the engineer sits. The antenna picks up any movement an engineer might normally make inside the cab—such as touching the throttle or the sanding valve or getting in and out of his seat.

Should he cease to make such normal movements, a buzzer sounds and a red light goes on in 20 seconds. If he doesn't respond to this alarm in another 10 seconds, the brakes are applied.

"Less Tiring on Engineer"

The president of one railroad which has a number of Alertors in operation says: "The thing that appeals to us about the Alertor is that it's less tiring on the engineer. As long as he keeps moving around, holding the throttle, touching the brake or whatever, the device doesn't set off the alarm. On a standard dead-man control he has to keep his foot on the pedal all the time which limits his motion."

And then he makes a disquieting comment: "Also, the new system isn't as easy to gimmick. In the usual system a man can put a weight on the pedal and then move away from the seat. (If he then had a heart attack, the train presumably would roll on unchecked.) In the new system, however, he has to be going through normal motions in the cab, or else the alarm is triggered."

Credit for inventing the Alertor goes to four men on the engineering staff of the Atchison, Topeka & Santa Fe Railway, which tested it in 1961. Last year the inventors extended to Vapor the right to make and market the device in return for royalty payments. The Santa Fe is installing the Alertor on 150 switch engines now in service and has ordered it for 26 new locomotives.

Seaboard Air Line Railroad, which has served termination notices on 150 firemen, has 10 Alertors now in service and is installing them at a rate of six a week. It has ordered 96 units in all.

Among other big lines ordering the device are Atlantic Coast Line, the Chicago, Burlington & Quincy, the New York Central, the Northern Pacific and Southern Pacific.

The railroads' drive to trim firemen from their rolls is also spurring business for other makers of safety controls. Westinghouse Air Brake Co., after the arbitration ruling, had "a flurry of interest followed by orders."

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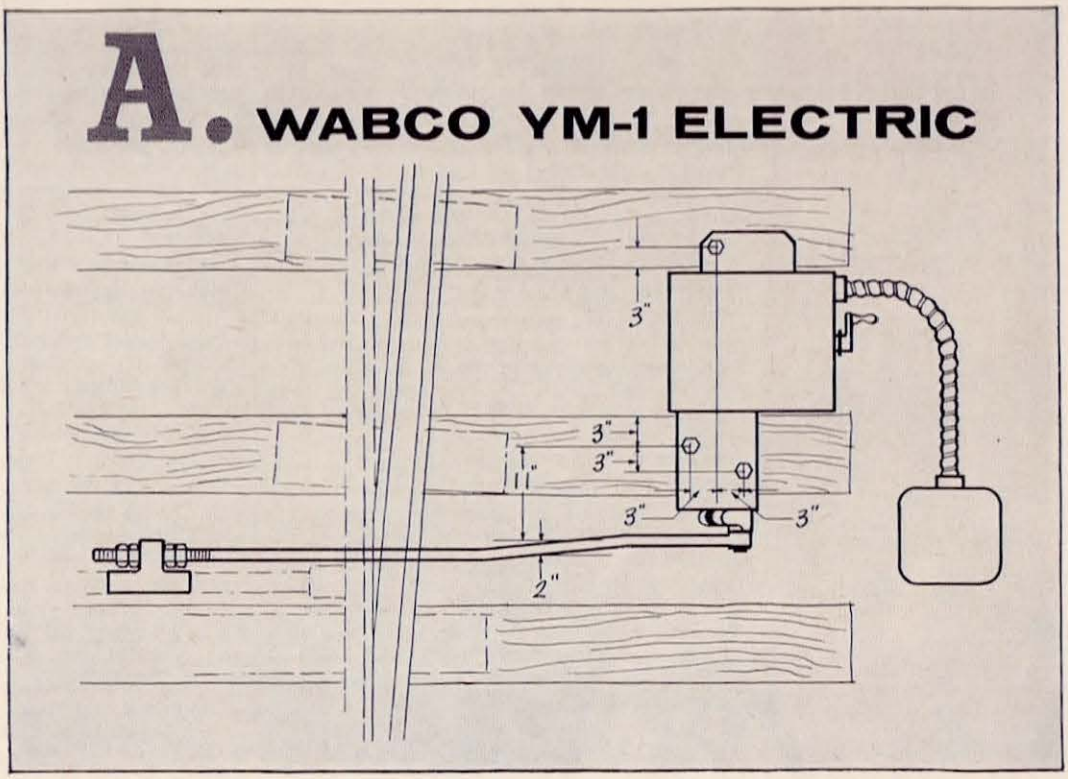

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RAILWAY AGE WEEK AT A GLANCE

June 15, 1964 • Vol. 156, No. 23

CP Toronto's quick switch

A new yard, plus CTC, will speed CP freight through Toronto **p.20**

Inside story on work-rules

Superintendents, at their meeting in Chicago, were given a full briefing on the work-rules struggle by J. E. Wolfe. **p.11**

Passenger-car pool suggested

A clearing house for coaches might help cut passenger losses through better equipment utilization **p.12**

New rail line hauls earth for Oro Dam

Contractors will haul 165 million tons of fill, for California's gigantic Oro Dam, over a new 17-mile railroad **p.16**

NYC goal: Integrated communications

A system-wide dial telephone network enables New York Central to provide better service for its customers **p.24**

Computers and the paperwork explosion

Even with mechanization, paperwork will grow. But it will be more meaningful for decision making **p.35**

The Action Page—Making capital more efficient

Full transportation economy will come only when capital is equally accessible to all modes of transport **p.38**

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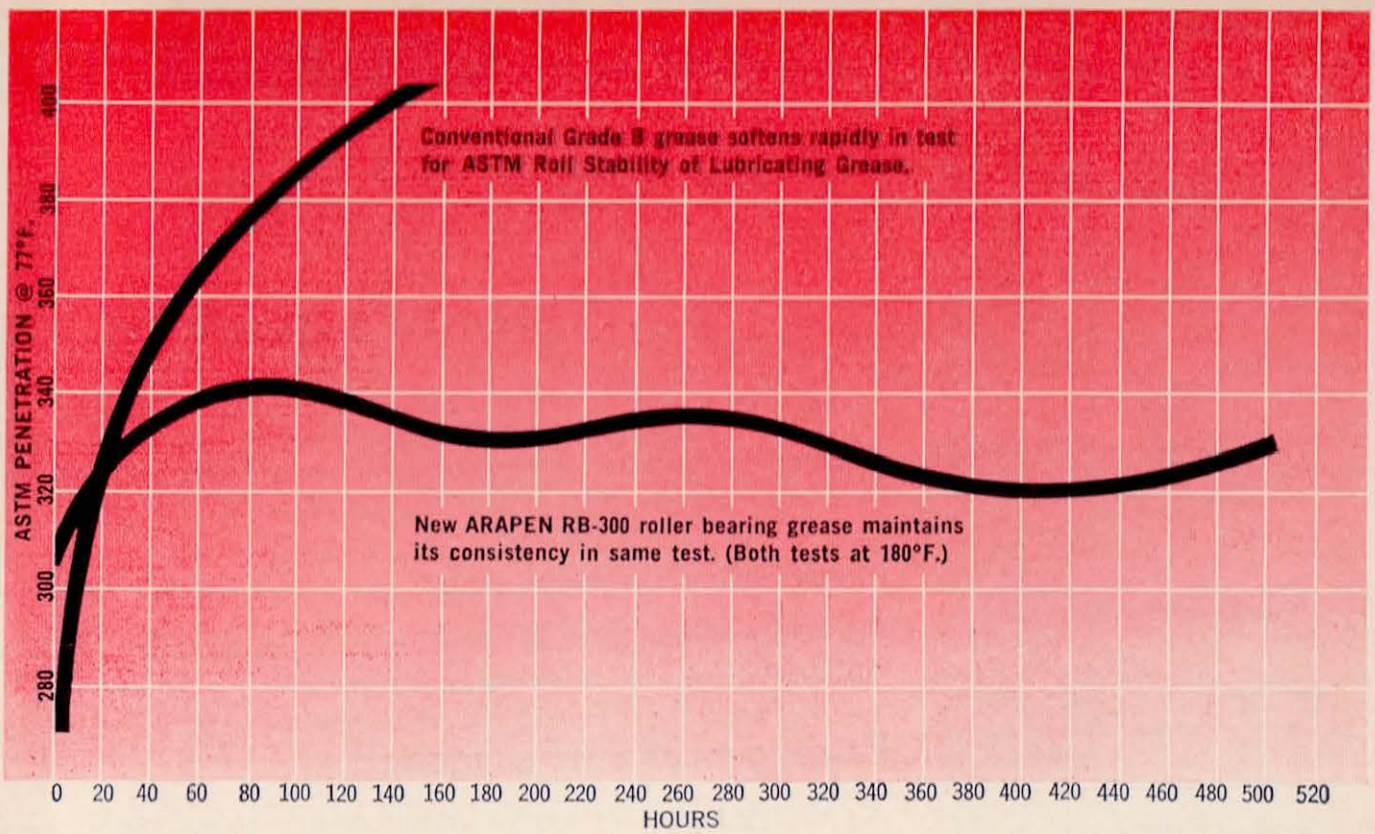
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SHORT AND SIGNIFICANT

Incentive per-diem bill clears Senate committee

The Senate Commerce Committee has voted to recommend Senate passage of S. 1063. The bill would authorize the ICC to prescribe incentive per-diem charges to promote more buying and more efficient use of freight cars. The Committee added an amendment to provide that the new power granted the Commisssion would expire two years after it issued its first incentive-per-diem order.

New Haven wants PRR-NYC merger hearings reopened

Calling plans proposed for the New Haven by the Pennsylvania and New York Central as "unrealistic and unacceptable," trustees of the bankrupt line have filed a petition with the ICC to resume hearings in the Penn-Central merger case. The New Haven says that each of the three plans suggested for it by the two larger railroads (RA, June 8, p. 7) "raises substantial questions of fact and law upon which the record is silent."

The work-rules dispute: At last, a conclusion

After nearly a week of discussion—agonizing, as one observer put it, over every comma and semi-colon, every adjective and adverb—the BLF&E late on June 6 ratified the White House agreement on the so-called "secondary" work-rules issues. The Firemen were the last of the five ops to approve the pact. But with their approval, it went into effect —and the long rules dispute was ended. Said BLF&E President H. E. Gilbert: "Obviously, the entire agreement is not wholly in our favor, but it represents the give-and-take of collective bargaining. More important, it proves that collective bargaining does work . . . once the parties sit down and start talking in earnest." Would he now predict the dawning of an era of labor peace? "I cannot," concluded the Firemen's president.

BRT demands: Pay boost, five-week vacations

One day after the Brotherhood of Railroad Trainmen ratified the agreement on the so-called "secondary" issues in the work-rules dispute, the union came back with its 1964 wage-benefit movement—asking for a 50-cent hourly wage increase and a vacation schedule providing for five weeks after 20 years' service. BRT President Charles Luna said the demands "will be filed on individual railroads and handled on individual railroads." BLF&E and BLE also have wage-benefit demands pending.

MP set to move on crew-consist award

Barring further delays brought on by BRT court actions, the Missouri Pacific and three subsidiaries were scheduled to place crew-consist arbitration awards into effect June 12. Earlier in the week, U.S. District Court in Washington, D.C. turned down a Trainmen's bid for a restraining order. Meanwhile, trouble cropped up at the Texas & Pacific-Missouri Pacific terminal in New Orleans, as SUNA members struck, apparently to protest application of arbitration decisions. The railroad got a court order, and the walkout ended about 12 hours after it started.

Adjustment Board problems probed

Members of the National Mediation Board and the First Division of the National Railroad Adjustment Board were scheduled to meet in Chicago last week with top-level representatives of the carriers and the operating brotherhoods. Purpose of the session: to wrestle with the case-backlog problem on the First Division and to take another look at the cost of handling cases. At least two bills dealing with the backlog problem have been introduced in Congress (with union support), but there's been no action as yet.

MONDAY MORNING REPORT

Public information and the work-rules case

With the ending of the five-year work-rules campaign comes a time for summing up—for measuring the weight of the various factors which contributed to the industry's successes in the long campaign. One such factor, beyond a doubt, was the effort made—largely through the AAR but also by individual railroads—to inform the public about the rules changes the carriers wanted to make and the reasons why they were necessary.

Support: Won, maintained

Perhaps the most significant point about this effort is that the railroad industry won and maintained a public, press and governmental support unlike anything it had had in a labor case for the past 30 years or more. And the gains were made in spite of the fact that the carriers themselves were the moving, pressing, forcing parties. The operating brotherhoods —used to public sympathy or at least neutrality toward their contract demands in past years—tried hard to counter with their own public relations and advertising programs. But the ops' campaign never caught fire—and comments from union leaders now indicate that the organizations feel fortunate to have come out with the moderate gains they made in the White House settlement on the so-called "secondary" issues.

And now for the problems ahead:

The ending of the rules fight, however, leaves railroad public relations men still with major tasks—both internally and externally. On many properties, public relations—even now—lacks the appreciation and confidence of top management. On a number of roads, there seems to be a definite need for improving channels of communication (up and down) between top management and the rank-and-file and between top management and middle- and lower-level supervision. Moreover, the operating unions—by demanding local negotiations and settlements on wage and rules issues—may put new stresses on individual PR departments.

Challenges: They'll be met

From all indications, the professionals in the business are reacting professionally to what is a continuing challenge in the management-labor and other areas. A new industry advertising program—apparently of the institutional variety—is under consideration. A committee of public relations officers is setting out in the best logical fashion to bring about improvement in employee communication—by finding out exactly what is and isn't being done today. And the Railroad Public Relations Association meeting at Miami Beach this week, is devoting a sizeable part of its program to a study of company-employee relations and communications.

Public relations—a growing factor

In both areas—public and employee relations—some observers see unparalleled opportunities. Events of the past few years pointed up the vital nature of the job the industry does—and from that base can be built an improved image of the railroad as a progressive, enormously capable transport medium. Events since 1959 also may have changed employee attitudes, to a degree. More than ever and perhaps above all else, employees want to know what's happening, what's going to happen, as it affects their jobs. Railroads that are telling them, flatly and unemotionally, are finding the reaction good. And the new opportunity for improvement on both fronts—public and employee—should now be contributing to a rise in a railroad PR department's stock.

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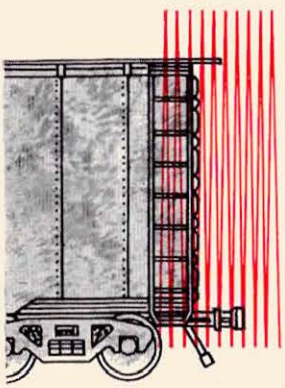

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SUPERINTENDENTS HEAR . . .

Inside story on rules

From court house to White House, AARS members got the full picture of the work-rules struggle from carriers' chief negotiator Wolfe. His forecast: most award troubles will soon end.

Railroad superintendents last week got what was perhaps the most complete summation—and forecast—on the work rules dispute that has been made publicly to date. It came from J. E. Wolfe, National Railway Labor Conference chairman, who got a standing ovation after his half-hour presentation covering the five-year affair.

Sharing the speaker's program in Chicago—at the annual meeting of the American Association of Railroad Superintendents—were Delaware & Hudson President J. P. Hiltz, Jr., and Pennsylvania's vice president-operations, David E. Smucker.

● **Work rules — what happened?** From the chief negotiator in the long work-rules struggle—Mr. Wolfe—came these predictions and comments:

—The industry "in all its endeavors must function as a team." It must be led and guided by individuals "dedicated to the proposition that this industry will succeed. If this is done, there is no question as to the outcome."

—Though disputes in the courts and before Arbitration Board 282 have arisen as to application of the board's award, within 60 to 90 days "most of the difficulties in applying this award will disappear."

—Railroads which have found it necessary to go to individual-property arbitration on crew-consist issues have won on virtually all points. Under these circumstances, it's safe to predict that over the two years in which the award will be in effect, the carriers may be able to eliminate as many unneeded road and yard train-service positions as they will firemen positions.

—There are certain signs of improvement in railroad management-labor relationships generally. The unions are beginning to accept the philosophy that if the carriers are to prosper and thereby provide greater job security and even an expansion in job opportunities, there must be cooperation where there is this mutuality of interest.

● **How negotiators reacted.** Mr. Wolfe also gave AARS members a rundown on reactions to the various proposals and recommendations made during the five-year dispute. Findings of the Presidential Railroad Commission, he noted, were basically good. But the recommendations of Emergency Board 154 were "not sound, not good"—and the industry may well have benefitted from the operating brotherhoods' declining to accept them.

The industry's chief negotiator also recalled the late President Kennedy's proposal that the case be submitted to Supreme Court Justice Arthur Goldberg for mediation and, if necessary, for final determination. The carriers, he recalled, accepted and the unions did not—and this pair of decisions may have improved railroad public and Congressional relations more than any thing that had happened previously.

● **False-premise amendment.** Congress, of course, finally passed a law submitting the manning issues—not all issues—to arbitration. And so far as Mr. Wolfe is concerned, amendment of the bill to cut it back to the fireman-off and crew-consist issues was based on a false premise—that the parties themselves had agreed to such arbitration. Said the NRLC chairman: No such agreement had been reached.

Will help carriers

As for the board's award: "It was a good award. It basically accomplished what we sought to achieve."

And as for the agreement which has brought settlement on the remaining issues: "By and large it will help the carriers in some respects—and with one exception, the provisions favorable to the unions had been contained in the PRC and emergency-board recommendations which the carriers had accepted."

● **Surprise for the ops.** Many factors, he noted, contributed to the railroads' success in the case. Among them: The operating unions "could not conceive of the railroads taking the offensive."

Both D&H President Hiltz and Pennsylvania VPO Smucker urged superintendents to take the offensive.

Mr. Hiltz stressed the superintendent's role in providing efficient operation at the lowest possible cost and in aiding traffic sales forces in every possible way. But he put the prime emphasis on the operating officers' role in personnel development: "A superintendent must get things done through people. If these people don't fully understand what is to be done, why it is to be done and how it is to be done, there is certainly very little chance of an operation being performed in a satisfactory manner. Therefore, a superintendent must recognize and accept as his own the responsibility for training his people not only to do a job but also to do it well and to enjoy doing it. In short, he must assume the responsibility for personnel development. The fulfillment of this responsibility is becoming increasingly difficult and, at the same time, increasingly important."

The Pennsylvania's Mr. Smucker—who recalled his three assignments as superintendent with PRR as his "most rewarding jobs"—told AARS members that their job, basically, is a rather simple one: to manage resources and people with results producing maximum effectiveness, following a plan but with some latitude to modify that plan.

WATCHING WASHINGTON WITH WALTER TAFT

TAFT

• **PASSENGER-SERVICE DEFICITS** of the ICC's "35 selected large railroads" ranged last year from the Florida East Coast's loss of $1.06 million to the Pennsylvania's deficit of $33.9 million. That's the general showing of the latest compilation of passenger-service results which has been issued by the Commission's Bureau of Transport Economics and Statistics.

The FEC figure reflects operations of only a few weeks. That road has operated only freight service since early last year, when it was struck by the non ops. For full-year operation, the smallest 1963 passenger-service deficit was the loss of $2.03 million reported by Pennsylvania-Reading Seashore Lines.

THE ICC FIGURES also show that 1963's over-all passenger deficit of $398 million (RA, May 18, p. 8) absorbed about one-third of the year's net from freight service, which was $1.2 billion. That's how the net railway operating income for 1963 was brought down to $806 million.

RUNNERS UP on the high-passenger-deficit side were the Santa Fe's $32.9 million and Union Pacific's $26.8 million. Only one road on the Commission's list had a 1963 passenger-service operating ratio of less than 100. That was the New Haven, with a ratio of 98.57 but with a passenger-service deficit of $8.6 million. Next lowest ratios were New York Central's 105.11 and PRR's 108.55.

HIGHEST of the passenger-service ratios was Pennsylvania-Reading Seashore's 325. Aside from FEC's 316.67, the runner-up here was Nickel Plate's 193.75. Nickel Plate's passenger-service deficit, $2.04 million, however, was second lowest on the list for full-year operations.

AVERAGE REVENUE per passenger-mile increased last year, even though business was off as measured by passengers carried and passenger-miles. The revenue averages were three cents per passenger-mile in coaches and four cents in parlor cars and sleepers. These compared with respective 1962 figures of 2.89 cents and 3.97 cents.

• **THE COST OF DINER DOLLARS** rose nearly a nickel last year—from $1.40½ to $1.45 4/10. The specific showing, according to ICC figures, is that the ratio of diner and buffet expenses to revenues from those services was up from 140.5 to 145.4.

THE EXPENSE FIGURES include only the direct costs of diner and buffet services—nothing for hauling and maintaining dining cars, or for overhead. On that basis, the aggregate diner and buffet service loss of the Class I roads in 1963 was $19.2 million, the same as the 1962 loss.

ONLY THE NEW HAVEN, of the 19 roads with 1963 diner and buffet expenses in excess of one million dollars, made money on those services last year. It's net was $112,000, reflecting its payment of 92½ cents for each diner dollar. Biggest 1963 spender for diner dollars was UP, which paid $1.85. Next came the Rock Island and the Milwaukee, paying $1.75 and $1.74, respectively. Top 1963 revenues from diner and buffet services were collected by the PRR and the Santa Fe—each $5 million. PRR spent an average of $1.21 and Santa Fe $1.60 for each of those revenue dollars.

Passenger car pool suggested by Pullman Co.

In these days of declining passenger revenues, can railroads improve their profit-and-loss situation? Perhaps—and one big way could be through better utilization of equipment.

How could utilization be boosted? One way might be through a pooling of coaches—and the Pullman Company stands ready to handle the job, if the railroads think it's desirable.

George W. Bohannon, Pullman president, tossed out the idea to the American Association of Passenger Traffic Officers at their recent meeting in Chicago—not as something Pullman is promoting but rather as something the company would undertake on request.

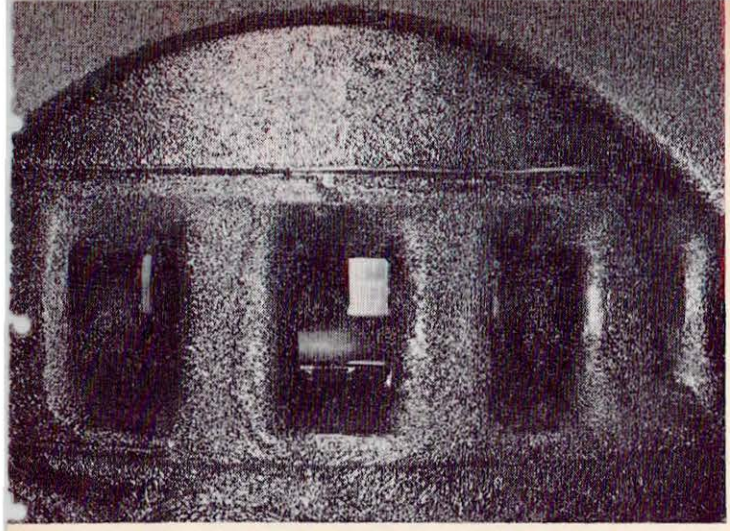
• **How pooling might work.** Present coach "borrowing" arrangements, he noted, do not seem to be working well—but a plan similar to the one now used in pooling sleeping cars might.

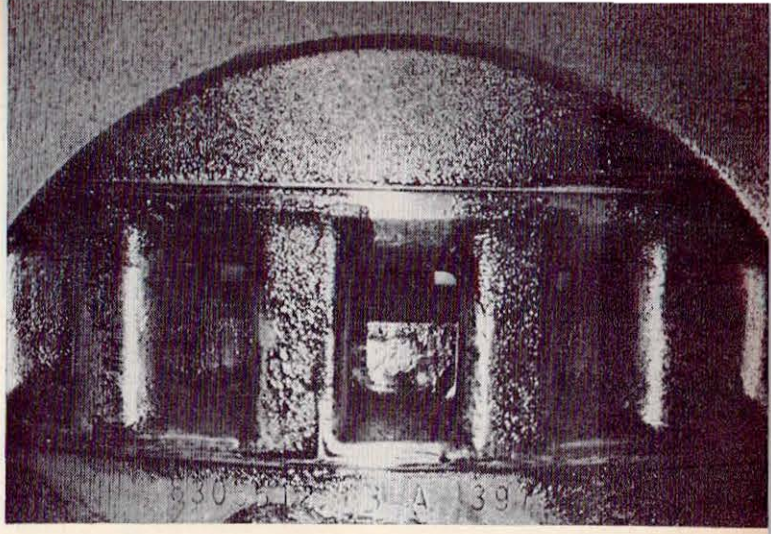
Mr. Bohannon summed up the Pullman Company's ideas this way:

The plan contemplates that an "equitable arrangement will provide that the owners be adequately compensated for supplying good cars and that the users bear the expenses that are incurred by their use. It contemplates that the pooling agency will be the clearing house for the expenses and will have certain responsibilities in respect to the condition of the pooled cars. Finally, it contemplates that the pooling agency will have discretionary powers to accept, to assign, to return or to refuse cars for pool service."

• **No formal plan.** Pullman's president emphasized that the plan is in no way a finished product. But, he said, "we know of no reason at this time why Pullman could not act as the agent for a coach pool, if requested by the railroads, and if the terms of the operation can be covered by some form of non-discriminatory and workable contract."

An AAPTO group has discussed the matter with Pullman—and, as Mr. Bohannon noted, there are certain compelling reasons for considering such a program. Among them: the decline in the heavyweight sleeping car fleet, which, in the past, has provided a hedge against heavy seasonal coach movements. In the 1961 Christmas season, he pointed out, 489 such cars were pressed into service—but the number available has dropped and "the heavyweight sleeping car is now almost at the end of the line."





Dirty engines can cost you money.

"RPM DELO Custom Plus" keeps engines clean!

ANNOUNCING A MAJOR BREAKTHROUGH: NEW RPM DELO CUSTOM PLUS RR OIL

First commercial Ashless-Detergent railroad oil cuts engine deposits, keeps engines cleaner than ever before, promises greater engine life, extended overhaul periods, longer filter life.

The same decided decrease in engine deposits as shown in the air intake ports above were found throughout engines using new Ashless-Detergent RPM DELO Custom Plus RR Oil.

This outstanding new oil was critically tested against one of the leading conventional type railroad oils in identical, *measured* engines on the same regular run. After 6 months and 90,000 miles on the country's hottest, dustiest run, compared to "RPM DELO Custom Plus", the conventional oil left 140% more deposits on compression rings and 53% more in the ring grooves. The other oil left 5 times the deposits in oil control rings, 9 times the piston skirt deposits. Top decks with the reference oil were 100% black, with "RPM DELO Custom Plus", 90% *clean.*

"RPM DELO Custom Plus" kept exhaust valve stems clean, the conventional oil left them 25% black. "RPM DELO Custom Plus" kept oil filters much cleaner . . . indicating longer filter life.

There is no doubt, this new oil, and another new "RPM DELO" railroad oil to be announced soon, are setting new industry standards. RPM DELO Custom Plus RR oil is especially recommended for severe service with economy fuels and is available now. Contact your local representative or write.

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Most railroad people know that Henry Miller makes darn good springs. But he's forever fussing to improve his product . . . and this on-the-LEVEL feature is one example of this forward thinking.

By flattening the top and bottom coils, the load rests secure—no chance of rock-n-roll as with other brands of coil springs.

As for basic qualities, Henry Miller uses the same high-quality steels, follows the same procedures to heat treat them, employs the same shot peening machines, the same methods of load testing as do all the best truck spring manufacturers.

BUT, the plus factor is this:

Henry Miller Rite-Angle springs not only deliver better service and longer life than any other truck springs without ground ends—but will match any others with ground ends—AT NO EXTRA COST!

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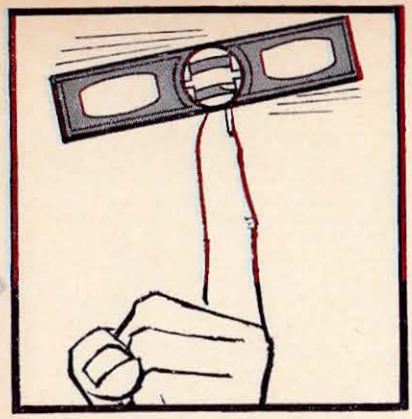
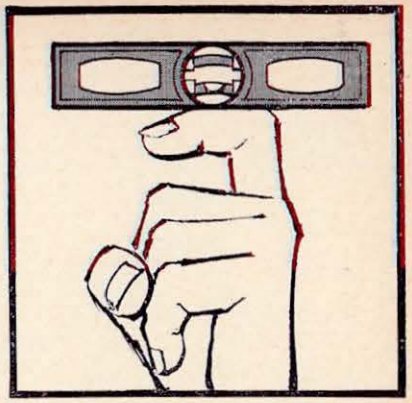
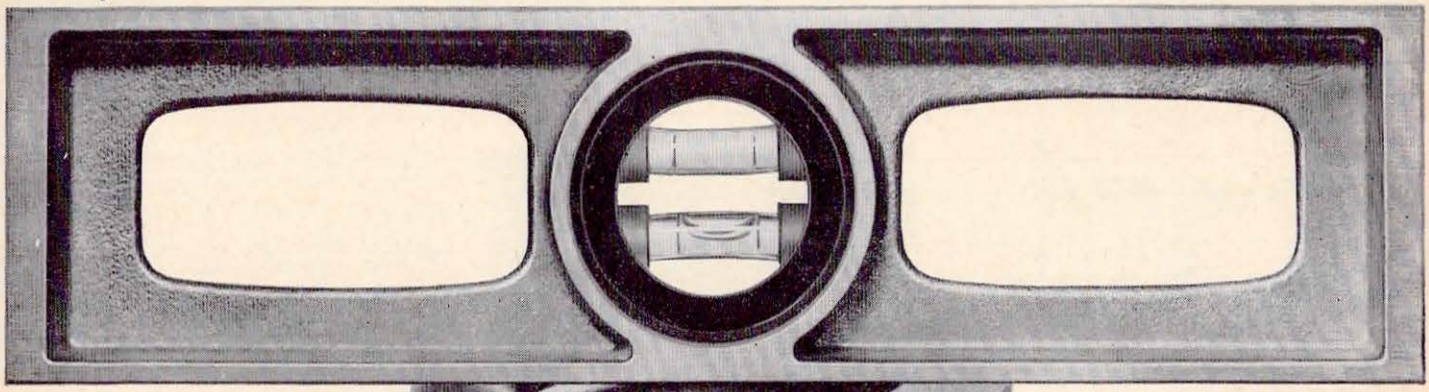


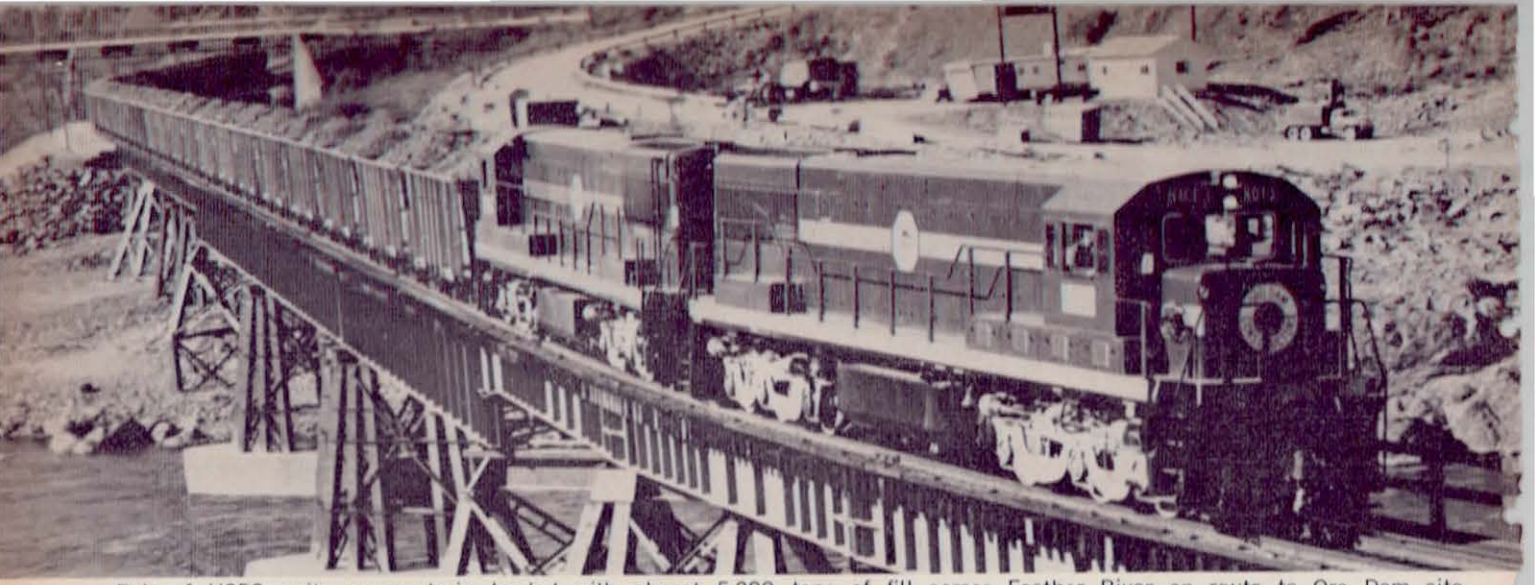
The tip of your finger is round . . . try balancing a level on it. Think it's easy?

This demonstrates the advantage of Henry Miller's Rite-Angle coil spring— an exclusive feature at no extra cost.



But put the level on the 'flat' of your finger . . . it's a cinch to balance!





Pair of U25C units moves train loaded with almost 5,000 tons of fill across Feather River en route to Oro Dam site.

New rail line hauls earth for Oro Dam

Confronted with one of the world's biggest moving jobs, contractors turned to a railroad.

When it came time to undertake one of history's biggest earth-moving jobs, it was time for a railroad. When there proved to be no railroad already situated to do the job, it was time for California contractors to build one.

● **Steel on steel.** The basic economy of the steel wheel on the steel rail has again been justified. Oro Dam will be the world's biggest earth-fill dam. Oro Dam constructors already have started to move material over 17 miles of new railroad at the entrance to California's Feather River Canyon.

Seven General Electric U25C locomotives and 180 Magor-built steel gondolas of 2,025-cubic-foot capacity are used in the trains which constantly shuttle back and forth over the line. Eventually they will have moved up to 1.5 million carloads—the 165 million tons of earth and rock required for the dam embankment.

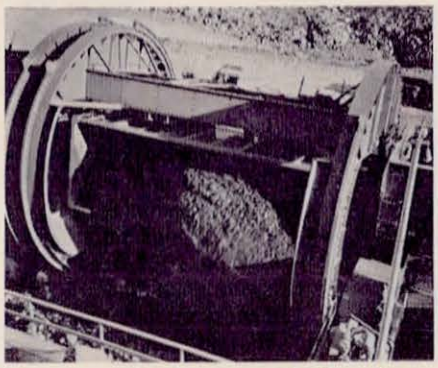
● **Non-defense project.** Oro Dam, largest non-defense construction project ever built under competitive bid in the U.S., will supply water for arid southern California areas as far away as Los Angeles and San Diego. It is also to provide hydroelectric power, flood control and recreational facilities. Rising 735 feet above the natural stream bed, the mile-wide dam will be three and one-half times larger than that classic earth-fill structure, the Gatun Dam in Panama. It will be 9 feet higher than Hoover Dam.

Upon completion in 1968, the Oroville Reservoir will contain approximately four million acre-feet of water, enough to supply all the household needs of California's current population for a year. Two power plants, with an initial capacity of 692,000 kilowatts, will be able to fill the power requirements of a city of one million.

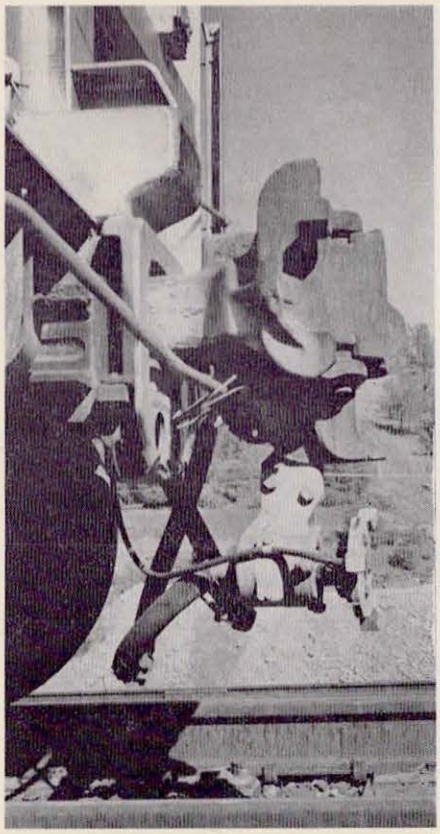
● **WP relocated.** Already the overall project has involved one of the largest railroad-line-change projects carried out in the U.S. in many years. That was the $40-million, 23-mile relocation of the Western Pacific starting just east of Oroville. This route involved excavations totalling over six million cubic yards, including five tunnels, and required construction of three major bridges—two across the Feather River and one over a major tributary. When the new line went into service in October 1962 (RA, Nov. 5, 1962, p. 14), it replaced the 27 miles of WP track near the floor of the canyon to be inundated by completion of Oro Dam.

Fill requirements for Oro Dam will total over 77 million cubic yards, most of which will be hauled 12 miles upstream to the site. The haulage route, which spans the Feather River three times, consists of about 12 miles of single track and five miles of double track with a maximum grade of 0.8%.

● **Unit trains.** Up this line, 40-car unit trains, loaded with as much as 5,000 tons of fill, are handled by a pair of six-motor, 2,500-horsepower locomotives in multiple unit. Each of these U25C units develops continuous



Rotary coupler in one end of each car permits the dumping of a coupled train.



Automatic connector, applied under F coupler, joins air and electrical lines.

tractive force of 79,500 pounds. The four U25C units delivered to Oro last fall were the first of this model GE had built. Three more arrived this spring. The U25C is a six-motor version of the 2,500-horsepower, four-motor U25B introduced for domestic railway service several years ago.

At the downstream site, a crawler-mounted, bucket-wheel excavator feeds a semi-automatic loading station which fills one of the 40-car trains in 8 minutes. Ten cars are loaded simultaneously. The train advances three times in the course of the loading operation.

The high-side Magor gondolas, each with a nominal 110-ton capacity, are built of LAHT steel. Sides and ends slope slightly outward from the flat bottom to simplify lading discharge. One end of each car is fitted with a National Castings Rotary F coupler which makes it possible to dump coupled cars. The other end of each car has a non-rotating F coupler. Because of the special rotary connector at the inner end of the shank of each of the special couplers, it is possible to invert cars in coupled trains without even disconnecting the air hoses.

● **Two at a time.** In the Oro operation the cars are emptied in pairs on the Wellman dumper at the dam site. This dumper is part of a high-capacity unloading system which handles and stockpiles material at an average rate of 10,000 tons per hour.

Couplers of all locomotives and those at one end of each of ten of the gondolas have been equipped with National Castings automatic trainline connectors which play an important role in the railroad operation. Unit trains are assembled so that there is one of the cars with the automatic connectors at each end. Inner ends of these two cars and all intermediate cars have conventional air hoses.

The National connector has, in addition to the brakepipe connection, electrical contacts which energize solenoids that open the air line on the head car. This is an electrical counterpart of the conventional angle cock. Each locomotive has also been fitted for remote operation of its uncoupling device.

It is therefore possible for one man to handle all coupling and uncoupling operations from a set of controls in the locomotive cab.

In operation, the two-unit locomotive pulls the 40 cars through the loader and makes its 12-mile run to the dumper. There it is uncoupled automatically and moves to the other end of the train where it can be coupled automatically. It is reported that the connectors have been performing very satisfactorily in the rugged construction operation. ■

RAILROADING AFTER HOURS WITH JIM LYNE

LYNE

EXTRAPOLATORS CAN ERR—Long before I found out what "extrapolating" is, I observed my first extrapolator. The fellow was an ICC statistician, and the time was not long after World War. I. His hobby was taking railroad traffic trends up to 1920, and projecting them at the same growth rate up through the 1930's and 1940's, allowing for increased population and increased consumption per person. Experience suggests that extrapolators, like everybody else, occasionally make mistakes. Most of them did with railroad traffic early in the Twenties, because they had no experience on which to predict accurately what the rate of growth of highways and motor vehicles was going to be. And there wasn't enough air traffic to measure—not even with a micrometer.

Some of the predictions I see now as to how much highway and air movement there is going to be in 1990 could also be running into some slight error. How many planeloads of people are there who would want to travel 6,000 miles in 4 hours for 365 days a year? I wouldn't want to do all that gadding around even if I had a pass. All the same you don't want to underestimate the potential of a competitor. Better overguess what he's likely to do to you, than underguess.

From the beginning of railroads till the late Twenties, the "railroad problem" was that of keeping the facilities abreast with the traffic volume. Since then, the problem has been to induce the traffic to match the facilities. Simple extrapolation seldom gives the right answers.

TIE LIFE OVERESTIMATED?—I saw some figures on tie renewals the other day—compiled by a friend of mine. The Class I roads replaced 205 ties annually per mile of track in the ten years 1922-31; 118 for the next decade; 109 for 1942-51 and a 61 average in 1952-61. In the year 1961 the average was less than 36. My informant observed that. "At this rate, the railroads are counting on their ties to last an average of 80 years." He is inclined to look on such an estimate as 300%, or more, in error—on the optimistic side.

IS THE PAST A YARDSTICK?—In a period of rapid change, figures of past performance are not always an accurate gauge to measure what is going on today. Maybe, for instance, there is a lot of branch line and duplicate mileage that will (or should be) abandoned before long. Tie renewal on such mileage (except that necessary for safe operation) would be an obvious waste of money.

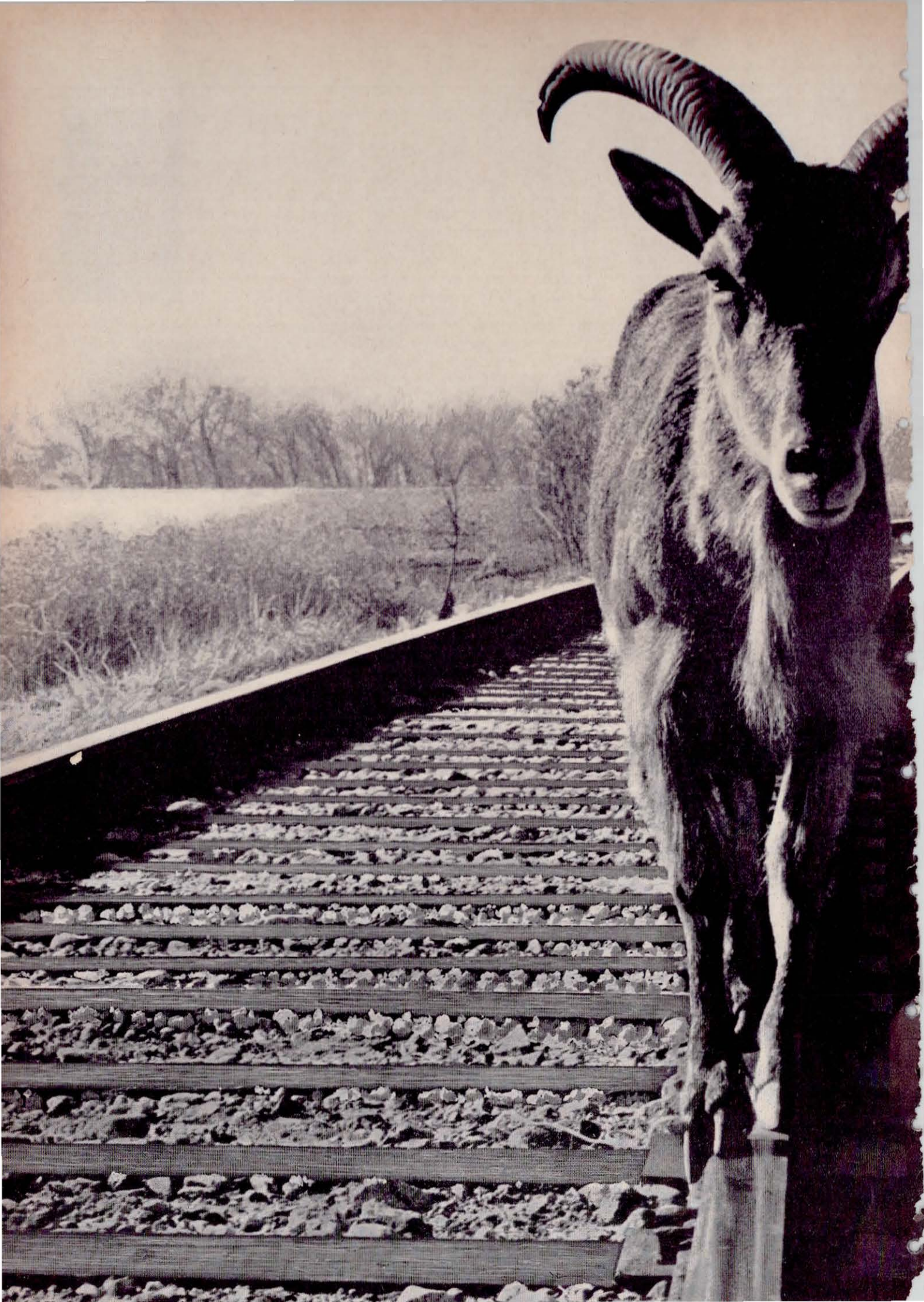
I recall, ten years or so ago, a lightly used branch line where new creosoted ties had all been distributed for better than 50% renewal—when along came ICC permission to abandon the line in question. The same work trains that took out the used rail also picked up the uninstalled ties.

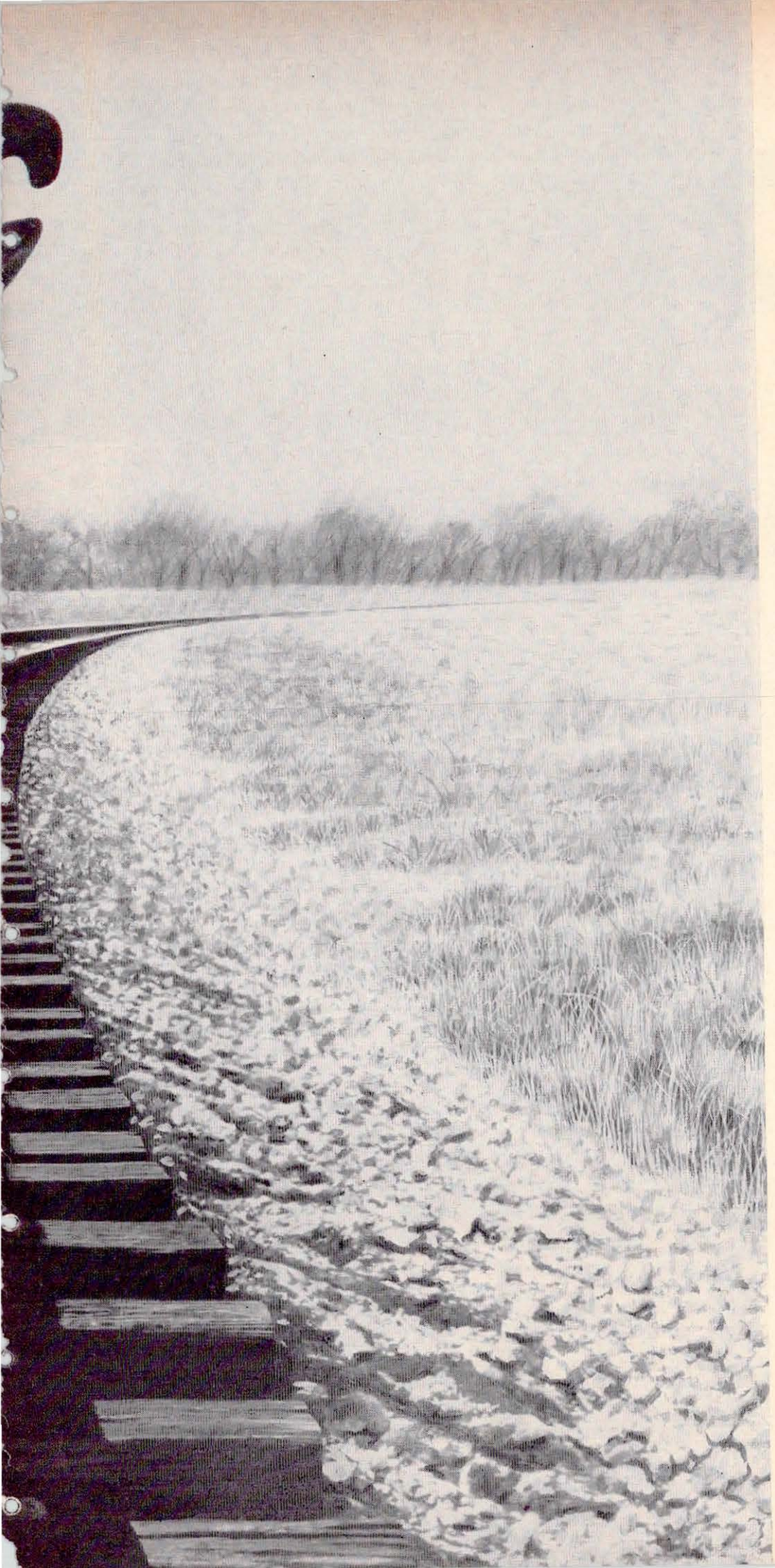
RAILROAD FICTION—A periodical that I became familiar with long ago—about the same time I first saw our own Railway Age-Gazette—was the Railroad Man's Magazine. We had a trainman in our town named Earp, who used to write railroad fiction for that paper, and was consequently regarded by us local boys as quite a highbrow. Putting together a piece of railroad fiction is no easy chore—involving all the usual skills of story-writing, plus the necessity of being reasonably accurate from a technological standpoint.

Railroad Man's Magazine was started away back in 1906. It suspended publication 1919-1929 but was revived as Railroad Magazine. It became bi-monthly in 1955. Freeman Hubbard, the editor and noted railroad enthusiast, tells me it is going back to monthly publication soon. More evidence that there is no waning—but quite the contrary—in "fan interest" in the railroads.

HARDWARE AS AN ARGUMENT—You try to sell a new idea in pricing railroad service (e.g., "agreed charges") and the regulators stop you dead in your tracks. But you combine your proposed pricing innovation with a new piece of equipment (for example, piggybacking, or Big John cars, or unit trains) and, having thus honestly dramatized your project, you usually get a much more friendly hearing.

Nothing in the world (it seems) is harder to gain acceptance for than a new idea—as long as it is just an idea with no physical innovations involved.





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General American's G-85 with center guide rails is the piggyback car that lets you be sure of quicker, safer and more accurate loading and unloading. Our exclusive center guide rails let you back up quick, without worrying about bumping or straightening. And your load rides stable and "sure-footed" with shock absorbing cushioned rub rails. Surely all this is worth a look at the G-85.

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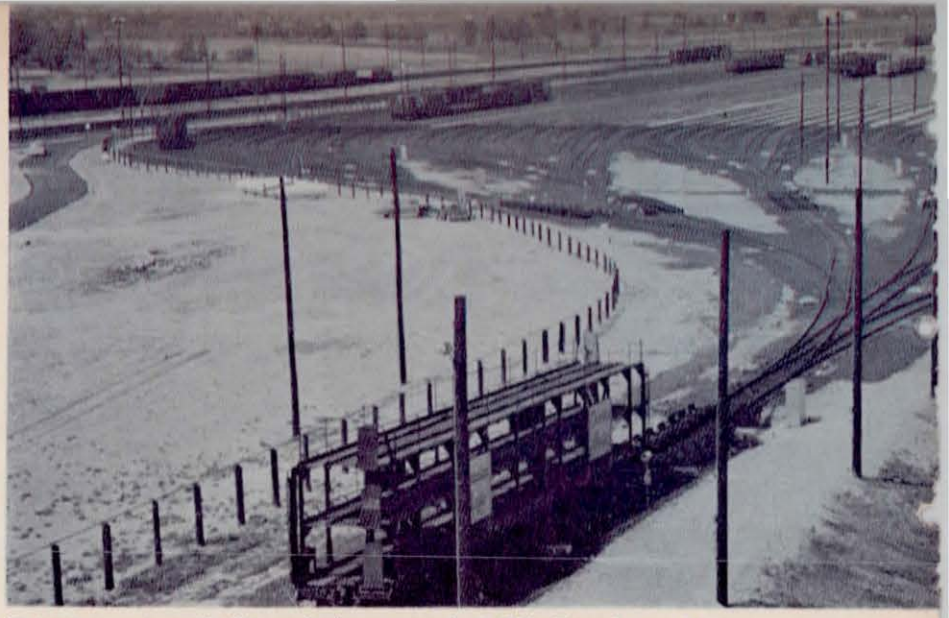


Retarders automatically control car speed at CP's Toronto yard.

Toronto's quick switch

Canadian Pacific's new freight classification yard will be able to handle up to 3,000 cars daily. CTC, television and radio are all serving the push-button automated yard. A big cut will be made in the transit time of freight moving through the Toronto terminal.

June 16 marks the official opening of Canadian Pacific's new automatic freight classification yard at Toronto, Ont. The $15-million facility, says the chairman and president, N. R. Crump, was "designed as the major element in a plan to speed freight traffic through southern Ontario."

• **CTC in terminal area.** Another important element in the program to improve service to shippers was installation of centralized traffic control on the double-track mainline in the terminal area. This 22-mile CTC territory extends from Toronto yard on the east to Dixie on the west. Over 1,000 moves are made daily through the interlockings in this CTC section.

When Canada's transport minister, J. W. Pickersgill, presses a button to blow a whistle to start humping in the new yard, his action will signify more than just an official opening. It will indicate to assembled shipper guests that CP is taking positive steps to improve service by upgrading its Toronto terminal facilities. A key task of the new yard is to classify in-transit freight trains which pass through Toronto from such points as Montreal, Ottawa, Sudbury, Winnipeg, Vancouver, London, Windsor, Detroit, Hamilton and Buffalo. The design capacity for classifying 3,000 cars daily will be sufficient to promptly handle inbound and outbound Toronto cars, as well as in-transit cars.

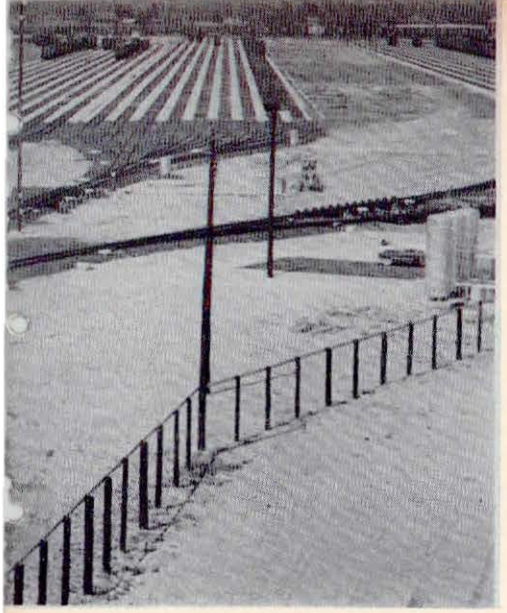
On the inbound side, cars will be classified into transfer cuts for industrial switching runs to existing yards at West Toronto and adjacent Lambton. On the outbound side, loads will be moved to the new yard in transfer cuts and then classified for over-the-road destinations. For example, the new yard has these classifications: Detroit, Winnipeg, points west of Winnipeg including Vancouver and Calgary blocks; Montreal terminals; Oshawa (large auto plant here); and other areas. Special types of cars can be classified into particular tracks, as for example, OK grain boxes (track 43); and 50-foot auto cars (track 12).

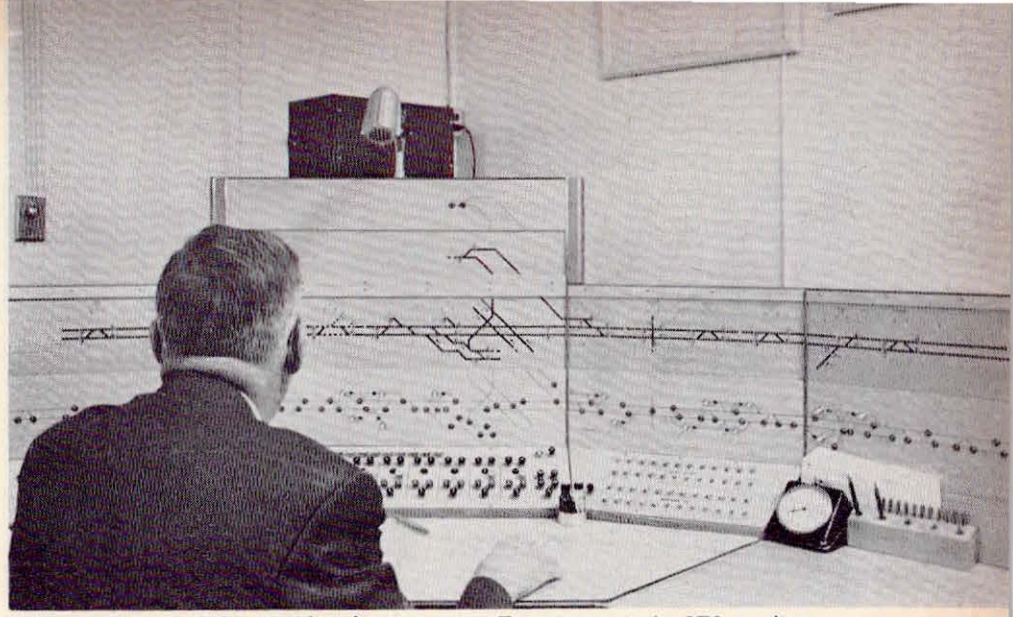
• **Faster transit time.** A considerable reduction in the transit time of freight in the Toronto terminals of the CP is expected because of: (1) a finer or more detailed classification of cars than was previously available; (2) a less time-consuming method of classifying cars; and (3) the use of CTC to expedite movements into and out of the yard and to provide more prompt handling of trains between existing yards handling industrial switching and transfer cuts.

Transfer of car repair and other servicing facilities from Lambton and adjacent yards near West Toronto to the new yard will enable CP to remove some buildings in these yards and provide land for industrial development.

When a train or transfer cut is to enter the new yard, the dispatcher so informs the train yard coordinator, who designates the receiving track on which the train is to be yarded. He informs the hump yardmaster via an intercom system. If the train is entering the yard from the west at McCowan, a special control insures the cooperation of the dispatcher and the hump yardmaster. It is a lever on the hump yardmaster's console which, in the clear position, allows the dispatcher to clear a signal directing the train into the yard. Because pull-back moves for trains going to the hump lead may occupy this yard entrance lead, it was felt desirable to enable the hump yardmaster to, in effect, block out entering road trains when he had pull-back moves in progress.

Assuming that there are no pull-back hump moves in process, the hump yardmaster remotely controls switches to line a route to the proper receiving yard track, dials a number that is lighted on the yard track indicator, puts his special control lever in the clear position, and then informs the dispatcher that the yard is ready to accept the train. The dispatcher then clears the entering signal, and the train proceeds into the yard. Meanwhile, a yard clerk has been notified of the train's approach (warning buzzer and light), so he may sit before a GE television monitor as the train passes a TV camera on the





A dispatcher at Union Station in downtown Toronto controls CTC territory.

leads approaching the receiving yard. He records car initials and numbers, or checks them against an advanced consist list.

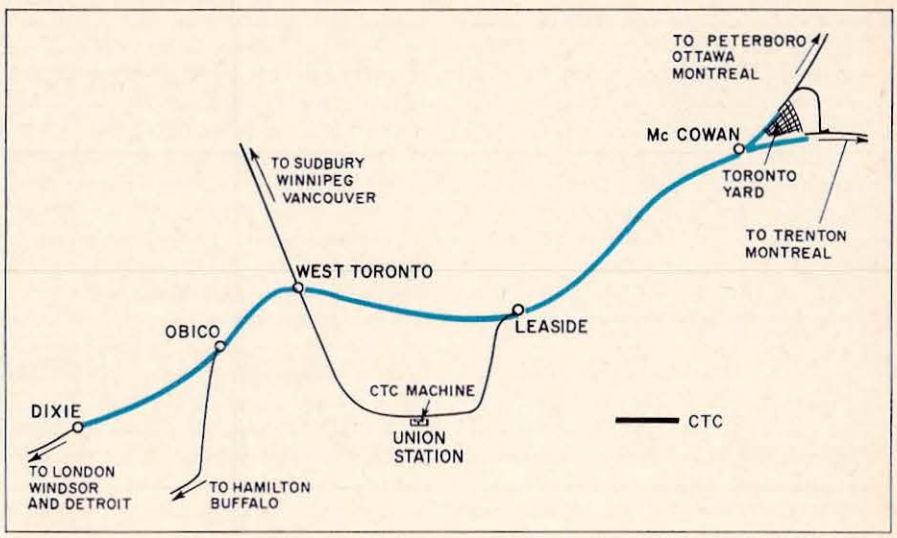
● **Pocket radios used.** Next, the train is inspected in the receiving yard. The carmen carry Motorola pocket radio transmitter-receivers for coordinating their actions with each other and to receive instructions from the car foreman.

Meanwhile, clerks in the yard office prepare the hump switch list using punched cards from the teletyped advance train journal (consist), and from the transcribed TV car check. The hump switch list is distributed by pneumatic tubes to the train yard coordinator, hump yardmaster, hump foreman and car retarder operator.

At about this time, the car foreman advises the hump yardmaster that the train has been inspected and is ready to be humped. He also tells him what cars, if any, require repairs. By radio, cab signals and wayside signals, the hump yardmaster directs the crew to pull the train from the receiving yard track to the hump lead.

● **Yard automation.** The new yard is equipped with Union Switch & Signal's Velac automatic freight car classification system. This system provides for automatic routing of cars to their proper classification track once the hump foreman has pressed numbered buttons designating the class track. The hump foreman can set up four class track designations, and these are stored in the system. Indications are repeated on the panel of the retarder operator's console.

The Velac system also provides automatic control of car speeds so that cars couple at 4 miles per hour or less without damage to lading or equipment. The new yard has a 54-cylinder master retarder and seven 26-cylinder group



Installation of 22 miles of CTC expedites movements to and from the yard.

retarders feeding into 63 classification tracks. Space has been provided for future installation of one additional group of nine tracks. Electro-pneumatic switches (model DA-10) complete their movements in 0.4 seconds, to provide for prompt routing of cars to class tracks.

Sixty-five-foot track circuits were installed in the class yard, and are considered to be of sufficient length to handle long cars. Normal practice is to hump single car cuts. Advantages of this practice are: (1) better operation of the automatic retarder controls; and (2) no misrouting due to improper pin pulling.

● **Proper speed control.** To control the speed of cars properly, the Velac system with its computer takes into account car rollability on tangent and curved track, car weight, distance to coupling and class track configuration. The computer calculates the correct leaving speed from the retarder and controls the retarder to obtain that speed.

The retarder operator, who monitors the humping operations, has an indicator panel which tells him the distance to coupling on each class track. Similar information, but in a different form, is presented on panels to the train yard coordinator and the hump yardmaster. Their panels indicate the number of cars standing in each class track. When a track is pulled, the train yard coordinator resets his class track car-standing number. This action automatically resets the hump yardmaster's car-standing designation.

To prevent cars from fouling leads at the bowl end of the classification yard, inert retarders were installed at the east end of each class track. These retarders were manufactured by Dominion Brake Shoe Co. and Track Specialties Co., and installed on a 0.3% upgrade.

After the train is classified, the train

yard coordinator informs the pulldown supervisor at the east end yard office about departing train makeup. The pulldown supervisor directs his three crews via Motorola radio, using a separate radio frequency for each crew.

● **Shove signals used.** To spot properly cars in the departure yards, lunar white shove signals are located so that enginemen can see them when shoving cars into a track. When the light is extinguished, he pulls back until it is relighted. Then he knows he has shoved the cars to the proper spot for yard air. Also, room is left on the opposite end of the track to add locomotive units or a caboose to the cars and still be clear of the fouling point.

The cars are often re-inspected in the departure yard, and a brake test is made with yard air. After the locomotive is on, a second brake test is made. Then the train yard coordinator is advised that the train is ready to depart.

On receipt of verification of the pulldown lists, the outbound consist is prepared in the yard office. Waybills, train orders and a consist list are given to the train conductor. The consist is also teletyped to the next destination yard and to the CP's computer center at Montreal.

Moving out on the line

When the train is ready to depart, the train yard coordinator so informs the dispatcher. For westbound trains, the dispatcher lines the route and clears the signal. For eastbound trains to Oshawa and Montreal, an information signal on the east yard office is used to advise the engineman when to leave. Because of numerous highway crossings between the yard and the mainline, CP practice is to hold a train in the yard until the dispatcher has lined the route and cleared the signal directing the train onto the mainline. Otherwise, a long train could pull down to the home signal and stop, blocking several highway-railroad grade crossings. To avoid delays to vehicular traffic, the train is held in the yard. The east end supervisor, being advised by the dispatcher that the controlled signal is clear, then turns on the information signal (a yellow revolving beacon). Thus, the engineman of the departing train can proceed knowing that he will be able to move out of the yard and onto the mainline. This revolving beacon is for information only; the engineman must obey the aspects presented by the controlled signals.

● **Yard communications.** Various communications systems were installed in the yard to provide communications among a group of employees. Other systems, such as a 50-line dial telephone exchange, provide communications among various offices in the entire yard. About 20 offices are equipped with Bell telephones for employees who must talk with persons outside the yard. For example, the deputy general yardmaster, train yard coordinator, and similar supervisory persons, have city phones, as well as the CP yard dial phones.

Six talk-back speaker systems were provided, each for a particular purpose. The talk-backs enable two-way conversations with control consoles. Additionally, direct intercom is provided between the consoles. The train yard coordinator can listen in on any one of the six systems, as follows:

(1) Red system, 34 speakers, console in hump yardmaster's office, serves west end of the yard.

(2) Brown system, 52 speakers, console in pulldown supervisor's office, east end of the yard.

(3) Blue system, 10 speakers, car retarder operator has the console, serves retarder area. Signal maintainers have R. W. Neill portable talk-backs for use in the signal shop and retarder computer room. They take Raco carryphones out for temporary connections to instrument cases and switch machines to enable them to talk to the retarder computer room or signal shop.

(4) Green system, 6 speakers, hump area, permits round robin conversations among hump foreman, hump yardmaster, pin puller, car retarder operator and computer room in the retarder tower.

(5) Yellow system, 13 speakers, console in general car foreman's office, serves repair tracks and car cleaning area.

(6) Black system, 10 speakers, console in general locomotive foreman's office, serves shop and diesel servicing area.

Group paging can be accomplished on the talk-backs; that is, one paging key will actuate several talk-back speakers in an area. This type of paging reduces the general noise level of the yard, and does not distract persons that need not be concerned when paging is performed. R. W. Neill Co. manufactured the talk-back speakers, consoles and amplifiers for these systems.

● **Remote waybilling.** As an aid in speeding paperwork at the yard office, particularly with respect to waybill preparation, CP billing office at King and Simcoe Streets in downtown Toronto prepares waybills for cars loaded in the Toronto terminal area. By use of a direct Teletype circuit, a copy is simultaneously reproduced in the new Toronto general yard office. The clerk in the downtown office uses a keyboard machine and types the waybill information, whch is reproduced in multiple copy form on a model 28 receiving page printer. Thus, no messenger service is needed to send waybills to the new yard.

Humping operations are monitored by an operator (right) at a tower control panel. Indicators inform him of the distance to coupling on each track class. Similar information, but in a different form, is presented on panels to the train yard coordinator and the hump yardmaster.

In most cases, the waybill is at the yard and available for use in preparing hump switch lists prior to the car's arrival at the yard. To assure that the multiple copy form is properly aligned in the receiving page printer, and to determine that the yard is ready to receive waybills, a direct intercom circuit connects the two offices, permitting instant two-way conversation.

Various service facilities are provided for both men and equipment at the new yard. There is a dormitory with 49 single bedrooms, and a restaurant. Lunch facilities and washrooms are provided in all other buildings.

● **One-spot car repair.** A Railway Maintenance Corp., one-spot car repair facility was constructed with four tracks to handle light repairs. The inbound end of each track is protected by an electrically locked switch which can be released only by the assistant car foreman at the control panel in the shop building. When the lock is released, the yard crew can place 8 or 9 cars on an inbound track. A movable point derail, in the derailing position when cars are placed on these tracks, prevents the yard engine from shoving them into the working area. When the inbound switch has been closed and locked, the assistant car foreman can close the derail, and actuate the car puller to move the cars into the repair shop. When the cars have been repaired, they are pulled out of the shop (other end) by a second car puller. Switches at the outbound are also protected by derails and electric locks on the hand-throw switches at the yard lead.

Adjacent to the car repair facility is a car shop building for the general car foreman and his staff. The building has space for such things as air brake cleaning and testing. Other car facilities include three car washing and upgrading tracks and a load adjuster.

The diesel shop, with three tracks, has capacity for six diesel-electric locomotive units under cover. The shop is equipped with facilities for servicing

and making running repairs to diesel units operating in and out of the Toronto area. Attached to this building is a stores building which will serve the entire yard.

The class yard leads and working areas are floodlighted by 416 mercury vapor lamps mounted on poles 62 feet above the ground. High floodlight towers strong enough to withstand the considerable wind in the area were considered uneconomical, compared with mounting lighting units closer to the ground.

● **Snow melters used.** Rails Co. propane switch heaters have been installed on class track switches and on power switches in receiving and departure yards to provide full operation. The retarder operator opens the feed valve from the main propane supply. The signal maintainer then operates controls to ignite each group of switches. The advantage of this practice is that the maintainer checks to see that each heater is properly lighted and functioning. He can make any adjustments necessary to assure proper burning.

Detecting snow—automatically

To shut off the heaters, the retarder operator simply closes the main supply valve. The maintainer then resets the group burner controls. Switches on some sections of the CTC territory are equipped with propane snow melters. At the locations, Rails Co. snow detectors were installed which, when detecting snow, turn on the heaters. After the snow has been melted and following a pre-determined time interval, the heaters are turned off. No controls or indications about the snow melter operations are transmitted to the dispatcher. This snow melter operation is completely automatic.

To provide better rolling characteristics for cars going into the class tracks, Raco rail oilers were installed just ahead of the measuring section on the hump and below the group retarders. Oil bubbles up through slots cut in the head of the rail.

Signal maintenance at the yard is under the general direction of an assistant signal supervisor. A signal technician is responsible for maintaining and making any needed adjustments to the Velac computer and control system. On first trick, 4 days per week, a signal foreman, signal maintainer and signal helper are on duty at the yard. For all other tricks on these days and for the remainder of the days of the week, including Saturday, Sunday and holidays, one signal maintainer is on duty.

Communications maintenance is similarly handled with an assistant communications supervisor in charge of maintenance of the telephone, radio, talk-back speaker and intercom systems. He is assisted by an inspector and several electronic technicians and radio men who work in the yard's communications shop.

● **Double-track CTC.** The 22 miles of double-track mainline CTC is controlled from a Traffic Master console in the dispatcher's office at Union Station. This console and the field equipment for the CTC project, such as switches, signals, relays and code system, were furnished by General Railway Signal Co. The control machine or console is the push-button type with a miniature track diagram to keep the dispatcher fully informed concerning the locations of trains or engines. It is normally dark, so that the appearance of light will attract his attention, which may require him to position switches and clear signals.

To line a route for a train, the dispatcher first selects the location where he desires to position switches or control signals. He presses a yellow location button (with black number) which causes small white lights in the track diagram to become lighted in the various routes available (showing positions of switches).

Next, he pushes a black switch button (white N or white R for normal or reverse). A green button is pressed for right or left signal clear. Finally, he presses a red code start button to send the controls to the field location. While switches are in transit the white line-of-light route lights will flash. When the switches are properly positioned and locked, and the signal clears, the white line-of-light burns steady for the route lined. The green signal symbol lamp lights, indicating a clear signal.

When the train moves into the route, the white lights are extinguished and a red lamp in the OS section is lighted. After the train leaves an OS section, all lights are extinguished so that the panel is again darkened in that section.

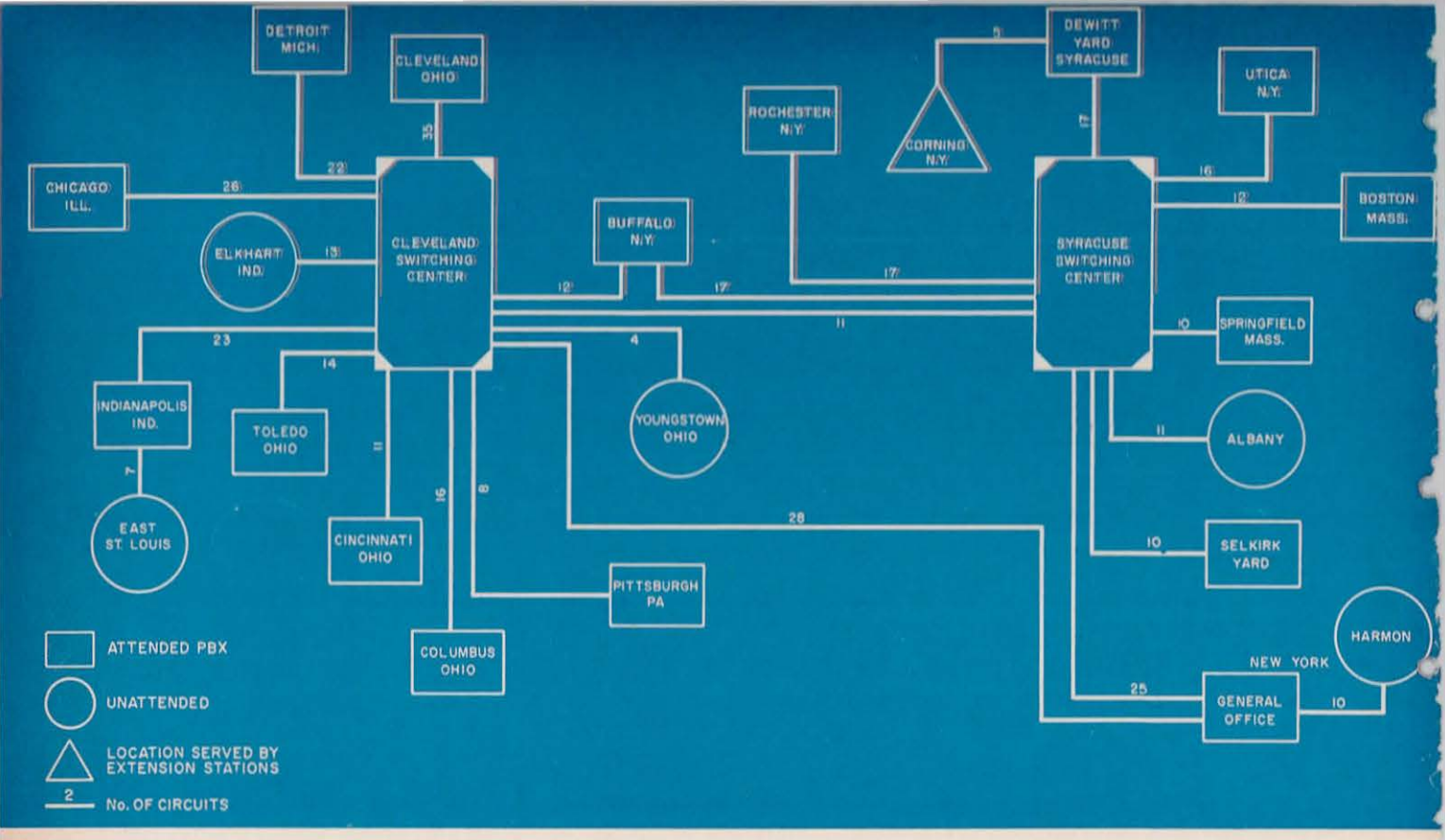
● **Dispatcher's intercom.** The dispatcher has various direct intercom circuits to other dispatchers handling both CP and Canadian National trains as well as type 62 selectored telephone circuits to stations or operators with whom he maintains contact. In addition, he has a dispatcher's line along the CTC territory for the use of train crews who desire to call him concerning a move. When the dispatcher desires to call a train crew or a signal maintainer, he can turn on an employee call lamp at various instrument cases or relay equipment bungalows along the CTC lines. When he sends out such a control, a horn sounds for 8 to 9 seconds, after which a white revolving beacon light is turned on. This is an indication that the dispatcher wants someone, either a train crew member or the signal maintainer.

Controls and indications are handled by a solid-state type E code system, which is a variation of the type L system (RA, Jan. 6/13, p.26). A continuous scanning indication system, the Mark II Syncroscan, polls each field station in turn to provide instantaneous information to the dispatcher about such things as the positions of switches and signals and locations of trains and cars.

Another aid to the dispatcher is a train graph recorder which indicates when an OS track section is occupied, when signals clear (a right signal or a left signal). At two locations, Canadian National lines cross the CP, and the train graph recorder reports on CN movements as well as CP movements at these interlockings. Separate pens at one end of the graph record these CN movements, so the dispatcher can readily identify CN moves.

Many hand-throw switches are electrically locked where they are on the mainlines. A short release section, usually two rail lengths, is used. At some switches, the GRS overlay track circuit is used for the release section.

Searchlight signals are used throughout, with aspects providing for speed signaling rather than the route signaling often used in the U.S. With speed signaling, the engineman is told only how fast to operate his train. He does not receive any information as to the route he is to take at a junction or crossover. ■



At the core of NYC's new system-wide dial telephone network are the switching centers in Cleveland, Ohio, and Syracuse, N.Y.

NEW YORK CENTRAL GOAL:

Integrated communications

The lines of communication between the road's offices got some added wiring with the inauguration of Tele Central. This direct-dial telephone system has been tied into NYC's computer-controlled teletypewriter network to speed up interchange of messages and increase efficiency.

Installation of a direct dial telephone system blanketing the New York Central is the second step the road has taken toward a fully integrated management information and accounting system. The first step, taken last fall, was the placing of a computer-controlled teletypewriter system in service. The third step towards automated information management will be to provide data subsets for telephones so a person can send data, as well as talk, over telephone circuits.

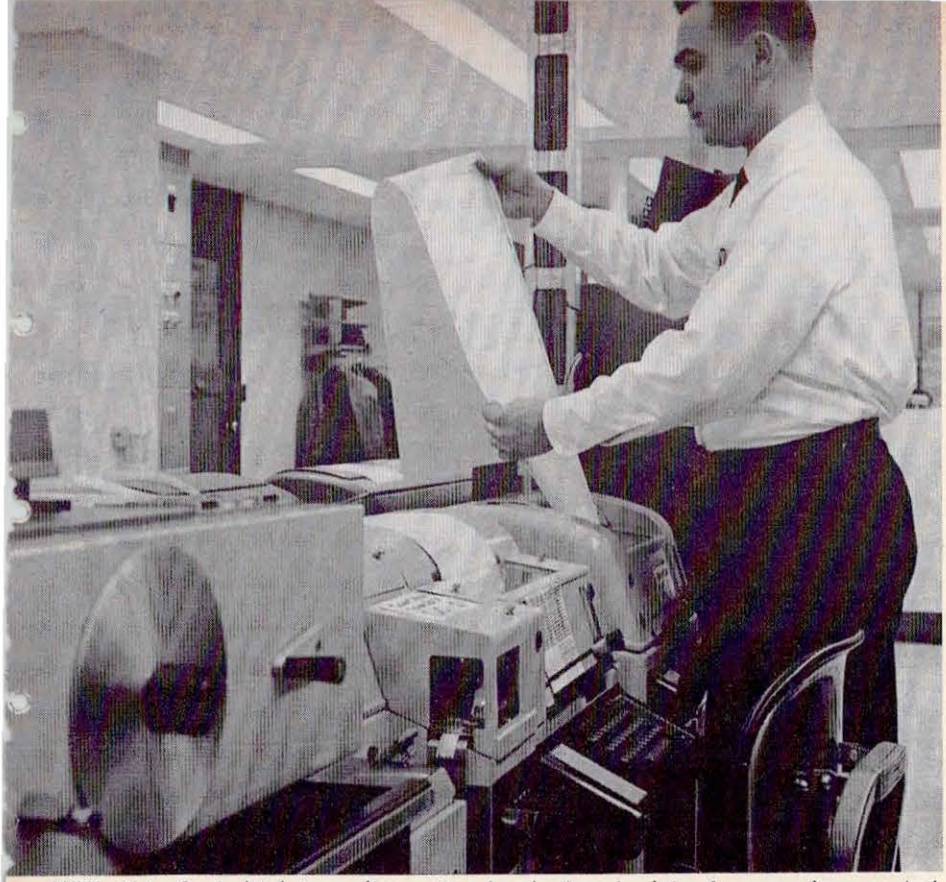
● **Service began June 6.** The direct distance dial network, known as Tele Central, was cut into service on June 6. The system has 10,352 dial telephone extensions in 406 cities connected to 47 telephone switchboards. Centrex, or direct inward dialing into the NYC general office in New York City, also went into service June 6.

Each telephone or extension can be reached by dialing the 3-digit exchange number plus the four-digit extension number. If a line is busy, the equipment automatically searches for the next consecutive extension number. Officers and other important persons may have two extension numbers so that when they are using the telephone their secretaries can handle other calls.

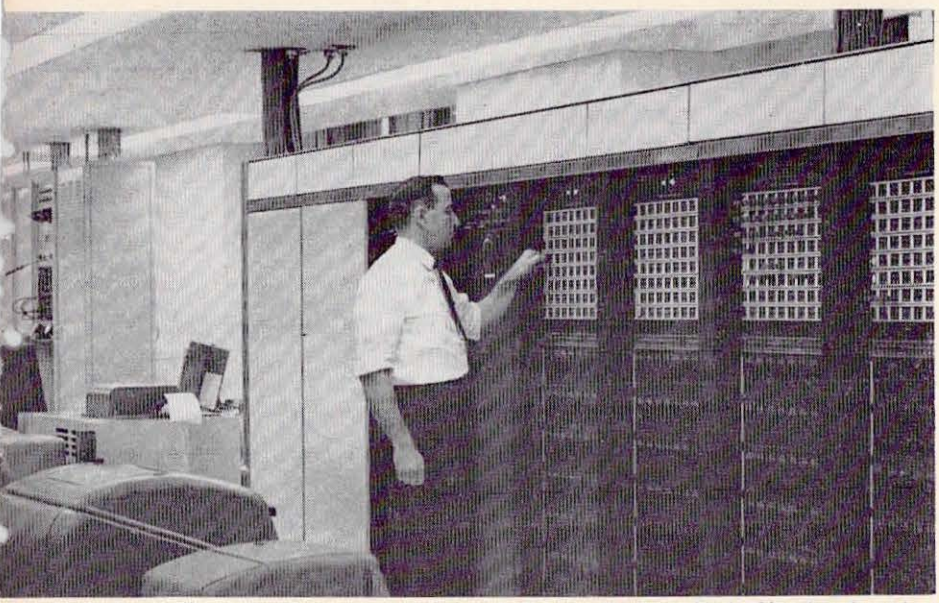
Universal numbering has been applied to Tele Central. Each city is designated by a three-digit number. Major cities' exchanges are directly connected to one of two 4-wire switching centers at Syracuse, N.Y., or Cleveland, Ohio. From any of the major cities, a person dials 8 to reach the switching center, then three digits for the distant city and then a maximum of four digits for the extension number.

● **Equipment is leased.** The equipment for Tele Central—including Centrex at the NYC general office, the four-wire switching centers, all telephones, attended and unattended PBXs—is leased from Bell System and other telephone companies. The majority of the circuits, telephone and teletypewriter, are furnished in Telpak groups by American Telephone & Telegraph Co. In general, the circuits connect NYC mainline cities.

For some branch line telephone and telegraph circuits, NYC removed railroad-owned carrier from mainline service, and also purchased some carrier equipment. Many branch line stations are served by party-line dial extensions off PBXs or by message circuit dialing. Where the railroad provides message circuit dialing, Stromberg-Carlson equip-



NYC's Data Central teletypewriter system has keyboard printer for supervisory control.



Data Central's controlling computer is at the road's New York City headquarters.

ment is used. Where railroad-owned party-line dial systems are in service, NYC purchased Lenkurt Electric single-frequency tone equipment.

Tele Central provides direct dialing to major offices and to practically any office on the railroad that has a telephone. This is accomplished by providing dial extensions off exchanges wherever possible. DDD for branch lines is provided by two-, four- or five-party dial lines or by going to straight message circuit dialing. Almost anyone on the NYC can dial almost anyone else on the railroad.

• **Seven days a week.** Among the advantages of Tele Central, according to Leo J. Ritter, project manager, communications, are its 24-hour, 7-days-per-week dependable service and high availability for the user. It saves time for callers, increases efficiency of operations, and enables the railroad to provide better service to customers.

Replacement of attended PBXs with automatic exchanges has produced some dollar savings. Freight sales personel like Tele Central because they can directly dial into the car-tracing bureau at New York City to request information. There are six telephone positions in the car-tracing center to handle calls.

• **Huge traffic volume.** NYC's teletypewriter system, known as Data Central, integrates all message and data transmission into one network. Fifty administrative lines feed into the Data Central computer at the road's New York headquarters. This provides for daily routing of approximately 8,000 messages of this type, with an average length of 300 characters. In addition, 65 car movement reporting circuits feed into this same New York switching center.

The 2,500 train-consist reports will average approximately 7.5 to 10 million characters per day.

At present, car reports come to Data Central at 100-word-per-minute teleprinter speed. The data is momentarily stored on disc files and then retransmitted to the transportation computer at up to 1,600 wpm. Ultimately, with direct cabling between the Data Central processor and the 1410-1301 transportation computer, car reports arriving at Data Central will be fed at computer speeds from Data Central to the 1410-1301 equipment.

The telephone network will also be suitable for transmitting data. The telephone may be replaced by a data subset. The telephone switching centers of Tele Central will ultimately be used for switching lines from the Data Central location to points on the telephone network. In this manner, interchange of data may be made between all offices on the system.

• **Unions are briefed.** The $1.5-million Data Central system, manufactured and installed by Collins Radio Co., was built to NYC specifications. To provide operators and maintenance personnel, the railroad discussed the situation with representatives of the Order of Railway Telegraphers and the International Brotherhood of Electrical Workers.

The unions were told, among other things, what Data Central was, how the equipment would operate and how NYC planned to use it.

All ORT and IBEW members on the railroad were given the opportunity to take a battery of mental and technical aptitude tests. Those who were successful in these tests, according to evaluation by communications and personnel department officers, were called in for personal interviews. Two types of personnel were sought: operators to man the Data Central switching center, and electronic technicians to maintain the equipment.

• **NYC paid for schooling.** Men who qualified and indicated a willingness to participate in the Data Central opera-

Basic units of NYC's Data Central system ar

The technical aspects of Data Central are explained as follows by NYC's director of communications, Robert C. Karvwatt:

The basic units of Data Central are similar to a conventional computer. They consist of input-output registers which are the connecting links between the C-8401 processor and the incoming and outgoing circuits, a control unit, magnetic core storage and logic units.

A variety of equipment inputs can be fed into Data Central. Teleprinters, magnetic tapes, punched cards, and paper tape are some of the typical inputs. Data Central will also produce a variety of outputs.

● **Does the job quickly.** The system merges, into a single system, five basic categories of equipment: data originating, data transmitting, data processing, conversion equipment and output devices. It demonstrates the advisability of using every device or concept that speeds up the process and results in a more efficient use of time, labor and equipment.

A dual-level memory is employed. A main core storage is programmed to perform a specific task and has a conventional-type memory. A second memory, using programmed logic, produces the operation requested by the main memory. The programmed-logic unit has 1,024 36-bit word capacity and a non-destructive readout. No conversion equipment is required for Teletype circuits. They work directly into the machine. Input lines are scanned at the rate of three times per character bit to insure reception of the correct start character.

● **Routing procedure.** The message-header is interpreted by the processor for correct routing. If the outgoing line is busy, the message comes through the processor and is stored in the disc file until the lines become available. The message is stored in the disc file only once, even though it may be going to as many as 20 different addresses. A message can be sent out as soon as the line becomes available. There is no need to wait for complete reception of the message. Transmission will be started as soon as the complete header has been received and verified, and the line is available.

Because most administrative messages are short, the full message will, in most cases, be received completely before being sent out. In the case of a message being received at low speed and being sent out at a higher speed, part of the message must be held within the processor until sufficient characters are stored to permit continuous output at the increased speed. It will go out as a continuous flow message making maximum use of the transmission time available to the system. The disc is used as intermediate storage in the system.

● **Multi-purpose tapes.** The magnetic tape units associated with Data Central serve several purposes. As each message is received, information from the header of the message—which consists of the station that originated the message, the station to which the message is destined, the length of the message, the time it was sent to Data Central and the time it was sent from Data Central—will be stored on a logging tape. The logging tape permits traffic analysis. Such analysis is a by-product of the system.

The same tape, put through a computer program, will provide information for readjustment of stations and circuits. The tape units also handle any overflow storage needs. For example, if a group of output lines are out of service, the information can be fed into tape storage and held there until the lines become available. Another purpose this might serve would be at nighttime when some stations may be shut down. Information can still be received for those stations stored, and based on a scheduled program to be sent out as soon as the station opens up the next day. The tape also becomes a historical file. Provision has been made to store a minimum of one month's messages in the historical file.

● **Messages retrieved as required.** The disc file will contain a minimum of 30 hours of current traffic data. All requests for servicing will be addressed to Data Central. The processor then can retrieve messages as required from the disc file. Any message in this file must be retrievable and printed out within five minutes.

Associated with Data Central is a high-speed, 600-lines-per-minute printer. Any messages or requests for servicing, and any checks to determine whether messages are garbled, will be printed out on the high-speed printer. In that manner, multiple requests for servicing can be handled in a short time. Again, the object is to speed up the operation and to reduce manual handling. If it is necessary to recreate a message or send a message back, the processor can be directed to send the message back without extensive manual intervention or creation of tapes. Two model 28 ASRs are used by switching center operators to control and supervise.

● **Messages are numbered.** Automatic message accounting will be carried out by the processor. A number is assigned to every message that comes into Data Central. Numbers are also

tion were sent for instruction to the Collins Information Science Center, Newport Beach, Calif. Men training for operator's positions had three weeks of schooling. Those training for maintenance positions attended the school for 15 weeks. NYC paid the men's expenses and salaries during the training period. Written and how-to-do-it-type examinations were held at the end of the instruction periods. Selection of personnel to man Data Central operator and maintainer positions was based on how the men did at the school.

Four job classifications were set up: senior switching center operator, switching center operator, senior electronic technician, and electronic technician. A switching center operator and electronic technician are on duty for all three tricks, 7 days each week. On first trick, a senior switching center operator and a senior electronic technician are also on duty.

● **Use of intercouplers.** An NYC communications development paralleling that of Data Central is the plan to reduce equipment rentals at 47 mechanized yards by installing intercouplers. Through the efforts of the NYC communications department, the intercoupler was developed to eliminate tape-to-card and card-to-tape conversions on train-consist transmissions. The intercoupler, operating in conjunction with standard card punch equipment, transmits punched card movement data over 100-wpm printer circuits and also converts incoming transmissions directly to punched cards.

The equipment, a solid state device, is being manufactured by Navigation Computer Corp. It will transmit data at the rate of 10 cards per minute. Also, the intercoupler can selectively transmit and receive, delete fields in punched cards or eliminate entire cards. Transmission can be stopped at any column on a card. The intercoupler will work with standard Teletype equipment at speeds of 60, 75 or 100 words per minute.

● **Yearly savings: $300,000.** Commenting on the advantages of the inter-

similar to a conventional computer

assigned to outgoing messages. If the originating station assigns an incorrect message number, Data Central will notify the station automatically that it has not used the right number. The correct number will be indicated. As each message is received by Data Central, an acknowledgement will be returned with the Data Central record index number. This number is the number that will generally be used to look up messages in the system for retrieval.

Other message-accounting means may be used: for example, the originating message number or a given period of time. As multiple address messages are received, they are checked off and a running account is maintained. It is possible to know whether the message has been sent out to all the addressees or to only some of them. If a message remains in the center for an undue period of time, the center will notify the control operator that it has a message it hasn't been able to deliver.

● **Half-hour checkups.** To keep the switching center operator informed as to how Data Central is functioning, a report is printed out every 30 minutes telling how many messages have been sent from the center, how many messages have been received from each station and a line status report.

A system of priorities is available within the equipment. Messages can be handled according to priority grade. A precedence message arriving on an output line automatically advances to the head of the queue, if there are other messages waiting, and it is first to be sent out. In this connection, it is not planned to use interruptable priority, although it could be used. All service messages going out from Data Central automatically become the highest priority messages without the need for any special designator.

Another type of priority called time priority may be employed. For example, a train is going from point A to point B, and there is a message that must get there before the train arrives. This factor can be programmed in the memory tables. Should the machine see this kind of message, it can automatically make it a priority message based on the destination and address information.

● **Three-letter station codes.** It is intended in this system to use three-letter codes as station designators. These codes are mnemonic designators; Chicago becomes CHI, Detroit becomes DET, and so on. What this does for the system is to standardize the address information so that anyone on the system can send a message to its destination, regardless of whether or not changes are made in station layouts. Any changes in codes, calls or anything else within the system can be done centrally.

Another kind of addressing available in the system is known as group addressing of messages. For example, if a message must go to stations A, B, C and D, they can be addressed by a special code, one code serving all stations, instead of taking time to address all of the stations individually. An example of how that might work is use of a train symbol in the car-reporting system to direct the advance consists to on-coming yards. The tables may be programmed to include the train symbol number, the origin point and the addresses that would be associated with that train movement.

● **Car-reporting example.** Code conversions, or conversion to parallel codes from serial codes, are done concurrently with the message switching. This permits transmission of messages to and from unlike terminal devices. Consider the car reporting system, which is a good example of an on-line communications problem or a real time communications problem. As car messages are transmitted through Data Central, they will be collected on magnetic tape. A special code has been inserted in the heading. When Data Central sees this code, it will know that this is a message destined for the transportation computer center. It will take the message, convert it from Teletype code into 7-level, BCD code and format, then store it on a magnetic tape for direct application to the 1410-1301 computer.

Eventually, this step would be eliminated on a program switch basis fed directly into the computer. Conversely, information can be received from the computer should the computer generate reports, and take these messages into the system, convert them from BCD code into Teletype code, and generate the messages and send them out to all the addresses without manual intervention.

Data Central polls all stations on a continuous basis. Where more than one station is on a circuit, the stations with heavier traffic will be polled more often than those with lighter traffic. Stations with little traffic are grouped on circuits, while stations with heavy traffic may feed directly into Data Central. For example, Elkhart, Ind., has two direct circuits to the switching center. On another circuit are West Springfield, Worcester, Framingham, Beacon Park and West Springfield yardmaster (all in Massachusetts).

coupler, NYC President A. E. Perlman says: "It cuts by more than 50% the amount of time formerly required for code conversions which were done manually before and after each Teletype transmission. On our railroad, data transmissions that previously required more than 120,000 machine hours per day will now be done in less than half the time, and we will save $300,000 a year in the cost of transmitting more than 700,000 messages."

Even greater use of Data Central is forecast for the time when a pilot station billing system on the road's Northern district is extended to the entire railroad. This system employs model 28 ASR teletypewriters for preparation of all waybills. The machine cuts a 5-channel paper tape simultaneously with preparation of the hard copy bill. The tape is then inserted into a Teletype transmitter and the data are sent to a small computer in the Detroit centralized freight agency. There, the data are processed into a number of machine-language records for use in accounting, operating and sales department work.

According to A. Scheffer Lang, NYC director of operating data systems, this developmental system is the key step in the implementation of a fully-integrated management information and accounting system for New York Central. Advantages of teletypewriter equipment, says Mr. Lang are these: "Teletype machines are relatively easy to handle, they are reliable, their cost is low and they are compatible with the over-all communications and tele-processing needs of the railroad."

● **'A new concept.'** Data Central, Mr. Perlman points out, "is more than a machine. It is a new concept in data collection and handling, so necessary to service the new technology. The system can be tailored to fit almost any requirement, including operating with other kinds of computers and other switching equipment. For example, any telephone on the NYC system can become an input for Data Central. Thus, Data Central opens the door to truly integrated communications." ■

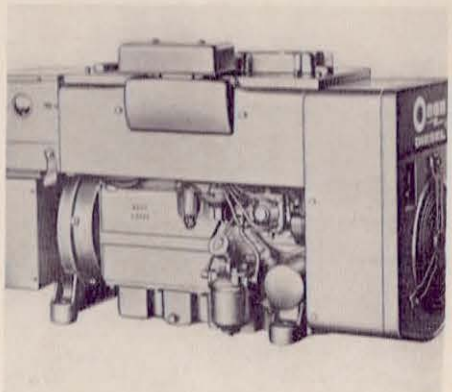
NEW PRODUCTS REPORT

Selective Calling (RA-1)

Up to 900 pocket radio voice-pagers, vehicular radios or fixed base stations may be reached individually with a new selective-calling console. Called Encoder 900, the pushbutton unit is used with regular two-way radio equipment. Compatible receivers may be called individually or collectively. Audible tones are sent by radio to activate and alert desired receivers. Then a voice message is transmitted. Encoder 900 is fully transistorized. *General Electric Co.*

Structural Panels (RA-2)

A non-slip surface of aluminum oxide particles imbedded in aluminum plate features a new laminated structural panel. The aluminum tread plate is bonded on one side of fir plywood backed by mill finish aluminum sheet, provides maximum traction. The panels, it is also said, offer exceptional stiffness, duplicated only by heavy structural steel, and longer distances can be spanned without costly intermediate members. *Met-L-Wood Corp.*



Standby Power (RA-3)

An air-cooled diesel-powered electric generating plant, rated at 12,000 watts for continuous standby service is available. Five different models in the series, DJD, are offered in all standard voltages from 120/240 single-phase, to 600 volts, 3-phase.

Also, each model is rated at 10,000 watts for continuous primary service. A 4-cycle, 4-cylinder engine provides 24 horsepower to drive the generator. *Onan Division, Studebaker Corp.*

Incinerating Toilet (RA-4)

The Destroilet waterless, chemicalless incinerating toilet has now been made completely automatic and the need for a bag to accumulate the ash has been eliminated.

Where the earlier models required the insertion of a bag and the setting of controls, the new unit, which is designated the Model L "bagless" Destroilet, is placed in operation by simply lifting and closing the lid. As in previous models, the only requirement for installation of the Model L Destroilet is the availability of electricity, either 110-115-volt alternating current or a 12-volt battery, liquid propane or natural gas, and a flue to the outside.

The unit disposes of human waste by burning the solids and liquids, converting them into harmless carbon dioxide and water vapors. It is reported that the new unit requires no flushing, emptying or plumbing and leaves no effluent liquids or solids. The manufacturer points out that the new Destroilet is particularly useful in mobile equipment. *LaMere Industries.*

Crane Control (RA-5)

Radio control replaces cab control of an overhead crane handling locomotive parts up to 15 tons in the shops of the USS Gary Steel Works. The system consists of a 5-lb control unit worn by the floor operator and an antenna-receiver assembly mounted on the crane bridge. The unit contains a transistorized radio transmitter, motion switches, battery pack and antenna. The system is said to be immune to electrical or radio interference. *Telemotive Div.*

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PEOPLE IN THE NEWS

ALASKA.—Russell Roy Mack, assistant personnel officer, Anchorage, Alaska, appointed personnel officer there, succeeding **Paul Shelmerdine,** who retired last October.

BALTIMORE & OHIO.—Peter J. Hart appointed director of product planning, marketing department, Baltimore, Md., reporting to **Charles J. Henry, Jr.,** vice president—marketing. Mr. Hart will direct a new product planning bureau established to increase freight traffic, through a more scientific study of shippers' distribution needs. Prior to joining the B&O in May, Mr. Hart was product manager, American Car & Foundry Division of ACF Industries, Washington, D.C.

David A. Watts, Jr., industrial engineer, appointed to the newly created position of assistant director of passenger services, Baltimore, Md. He will be responsible for the B&O's passenger marketing function, including sales and pricing of service. **James E. Sell** named manager passenger operations, another new post designed to provide for supervision of passenger train operations, with special emphasis on cost reduction. Mr. Sell will also work in cooperation with maintenance of equipment personnel, to provide improved passenger equipment and to reduce maintenance costs. Mr. Sell was formerly supervisor on the staff of the chief operating officer.

Harold E. Coppage, district manager—passenger sales, Washington, D.C., appointed regional manager—passenger sales, Central region, Chicago. Mr. Coppage will be responsible for customer relations and sales in the area extending northwest from Cumberland, Md., to Chicago. He will also supervise passenger traffic moving onto B&O lines from connecting roads serving the northwestern United States.

BURLINGTON LINES.—A. M. Woolf, traveling freight and passenger agent, Lubbock, Tex., appointed general agent, San Antonio, Tex., succeeding **Roy L. Lassiter,** transferred to Amarillo, to replace **A. D. Dodge,** retired. **Don N. Muller,** district passenger agent, Dallas, named city freight agent, Lubbock, succeeding **T. J. Hoffman,** who replaces Mr. Woolf.

NEW YORK, SUSQUEHANNA & WESTERN.—M. T. Staub, transportation supervisor, appointed superintendent, Edgewater, N.J.

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT.—David G. Hammond named structures engineer. He was formerly engineer, Headquarters Continental Army Command, Ft. Monroe, Va.

SOUTHERN PACIFIC.—O. G. Linde, assistant superintendent, Sacramento-Salt Lake Division, Ogden, Utah, named assistant manager of industrial development, San Francisco.

UNION.—James E. McGlashan, who has been with this road since 1951, at East Pittsburgh, Pa., became editor of the URR News, employee publication, on May 1, succeeding **Albert E. Brinkley,** resigned.

WESTERN MARYLAND.—Clifford C. Bruck, assistant to vice president—sales, Baltimore, appointed director of market research. **Malcolm J. Newbourne,** who succeeds Mr. Bruck, was formerly project analyst on transportation, Corning Glass Works, Corning, N.Y. **Carl N. Collins,** aide to general traffic manager, Baltimore, advanced to manager—freight rates. **W. Ray Downey,** freight traffic manager, Pittsburgh, promoted to general sales manager there. **John W. Grogan** appointed district traffic manager, and **John A. Gregan,** traffic representative, both at Pittsburgh.

Supply Trade

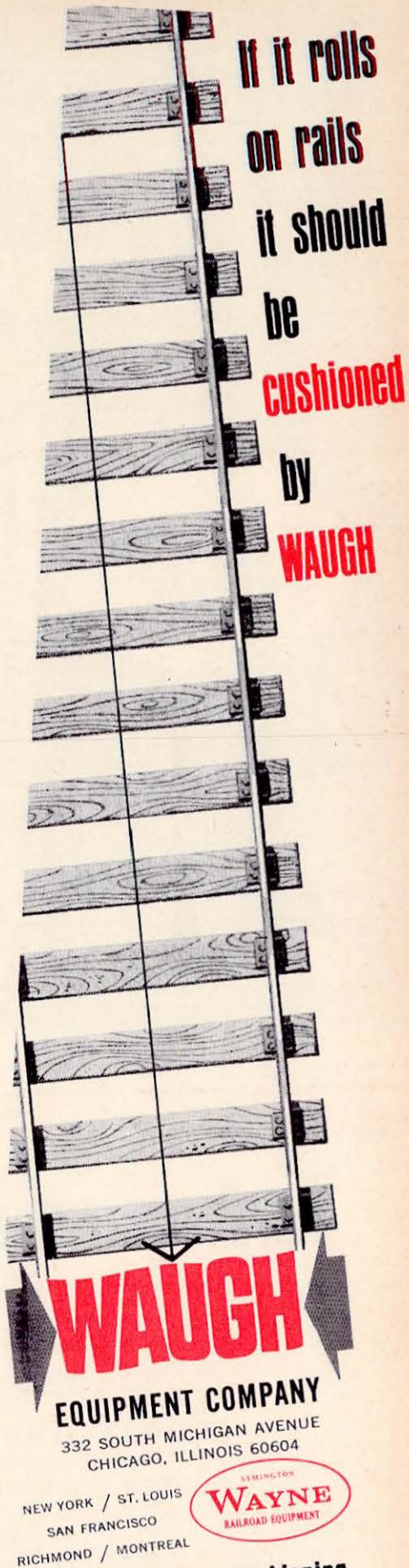
The **Safety Electrical Equipment Corp.** has purchased from the **Dana Corp.** the railway drive product lines. Safety also will sell and service the drive shafts and clutches which are associated with this product line. All work in process at Dana will be completed at their Toledo plant and then machinery will be transferred to Safety's New Haven plant.

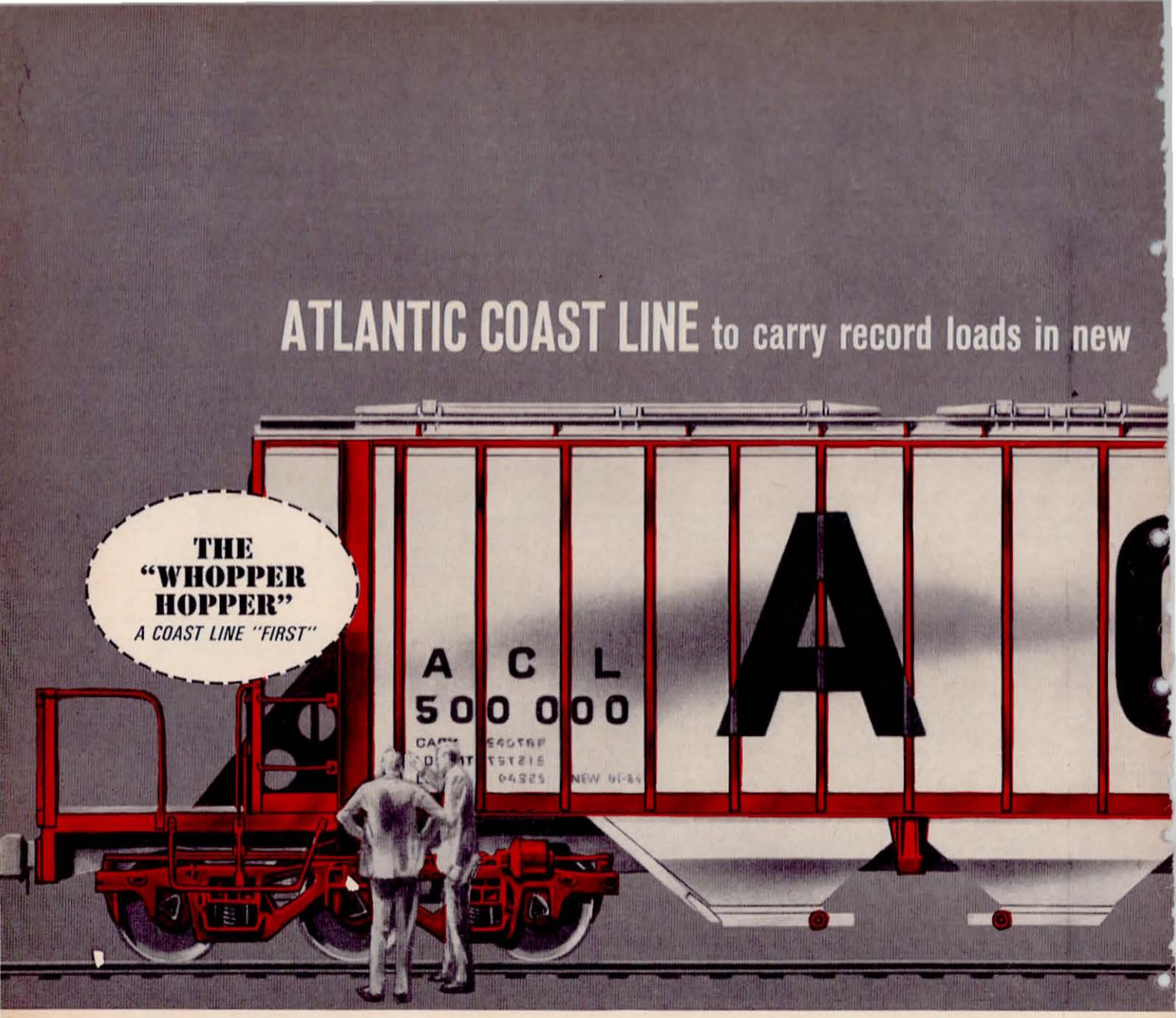
G. O. Whitesell has been advanced to manager of railroad sales for **Chromium Corp. of America** at Cleveland, Ohio. Mr. Whitesell gained knowledge of diesel engines with the **Seaboard Air Line** and as sales engineer for Chromium Corp. of America. He was formerly based in Atlanta, Ga.

The **Dow Chemical Co.** has named **John H. Wallberg** to the newly created position of field representative for all herbicides used by railroads headquartered in areas from Virginia north to New England and west to an area including Michigan, Ohio and Kentucky.

OBITUARY

Jack Wilson, 62, vice president, **Universal Railway Devices Co.,** died May 30 at his home in Chicago.





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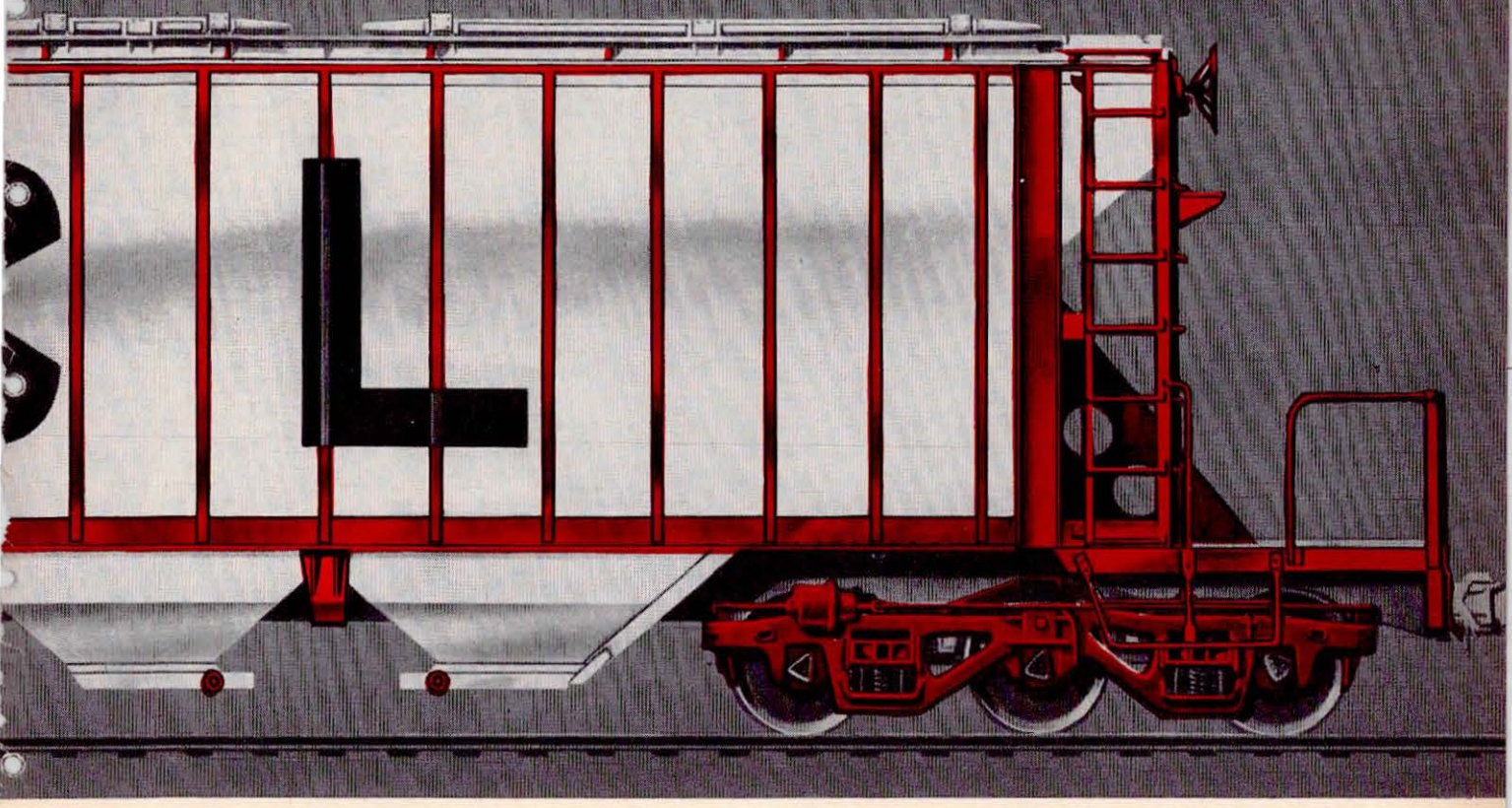

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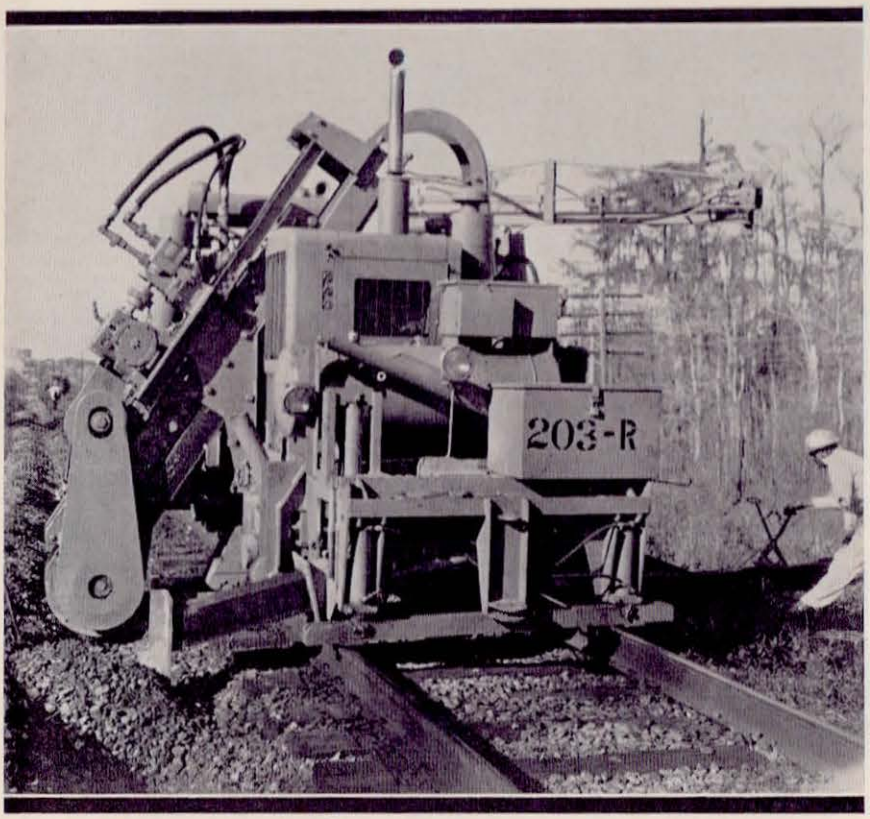

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AS THE PUBLISHER SEES IT

Korea: Big role for rails

SEOUL, KOREA, June 1

The Korean National Railway has a fine physical plant, substantially rehabilitated since the Korean War, and knows how to use it. The standard-gauge system totals about 1,800 miles. I had an opportunity to ride one of its five daily expresses over the main line from Pusan to Seoul. It's 272 miles, and best running time is six hours and 10 minutes. My train, a seven-hour, 10-minute schedule, consisted of 15 cars—12 coaches, a diner, an old standard 12-1 sleeper converted to a deluxe coach for U.S. Army personnel, and on the hind end, a mail-baggage car. This heavy train was powered by a small EMD 1,750-hp, six-axle diesel-electric. The train arrived at Seoul precisely on time.

The entire Pusan-Seoul line is double tracked, frequently on separate alignments. Virtually all tunnels and bridges —and there are many—are separated. The line was designed that way by the Japanese, who built it as a military supply route to China just after the turn of the century. It served this purpose effectively, even in World War II. American air forces had a difficult time effecting complete traffic interruptions; if they were lucky enough to score a direct hit on one bridge or tunnel portal, the alternate structure usually stood unharmed.

The entire route is laid with 100-pound rail on locally produced prestressed concrete ties. Grades are modest, despite the mountainous terrain, with a short ruling grade of about 1.9%. Freight trains, which are numerous, run with 50 loads or 70 empties, all using a single unit. KNR has 125 diesels and 280 steam locomotives. The Pusan-Seoul line is almost completely dieselized. KNR expects to order 65 more diesels momentarily (RA, March 16, p. 39).

Our train carried both second- and third-class coaches. The second-class coaches are excellent. Most are Japanese built, acquired three years ago.

KNR traffic is 50% passenger, 43% freight, 7% other; and operations are profitable. Passenger service makes money. Freight, due to depressed, government-controlled rates, is operated at a small loss.

Korea depends heavily on its railroad, and has a substantial capital improvement program to build new lines, upgrade existing lines, and modernize equipment.

Robert G. Lewis, Publisher

MARKET OUTLOOK

Carloadings rise

Loadings of revenue freight in the week ended June 6 totaled 580,152, cars, the Association of American Railroads announced on June 11. This was an increase of 3,214 cars, or 0.6%, compared with the previous week; a decrease of 25,209 cars, or 4.2%, compared with the corresponding week last year; and a decrease of 2,608 cars, or 0.4% compared with the equivalent 1962 week. Ton-miles generated by carloadings in the week ended June 6 are estimated at 13 billion, an increase of 0.9% over the corresponding week of 1963 and an increase of 10.2% over the 1962 week.

REVENUE FREIGHT CARLOADINGS
For the week ended Saturday, June 6

District	1964	1963	1962
Eastern	82,886	85,900	84,935
Allegheny	101,426	107,579	96,321
Pocahontas ...	54,961	56,078	52,622
Southern	110,855	111,208	107,146
Northwestern .	82,976	83,160	91,758
Central Western	109,264	118,177	110,840
Southwestern .	37,784	43,259	39,138
Total Western Districts	230,024	244,596	241,736
Total All Roads	580,152	605,361	582,760
Commodities:			
Grain and grain products	41,466	52,115	44,472
Livestock	1,854	2,160	2,906
Coal	112,025	116,907	107,515
Coke	9,414	8,991	5,874
Forest Products	38,117	38,181	38,108
Ore	54,661	51,090	56,210
Merchandise l.c.l.	12,691	17,363	23,940
Miscellaneous .	309,924	318,554	303,735
June 6	580,152	605,361	582,760
May 30	576,938	549,861	529,285
May 23	595,099	598,419	580,383
May 16	591,436	601,062	586,946
May 9	581,726	598,876	583,947
Cumulative total, 23 weeks ...	12,489,712	12,384,288	12,602,694
Estimated Revenue Ton-miles (millions) 23 weeks ..	285,200	267,700	259,500

PIGGYBACK CARLOADINGS.—U. S. piggyback loadings for the week ended May 30 totaled 16,998 cars, compared with 13,942 for the corresponding 1963 week. Loadings for 1964 up to May 30 totaled 358,927 cars, compared with 325,928 for the corresponding period of 1963.

IN CANADA.—Carloadings for the 10-day period ended May 31 totaled 102,255 cars, compared with 72,036 for the previous seven-day period, according to the Dominion Bureau of Statistics.

	Revenue Cars Loaded	Total-Cars Rec'd from Connections
Totals for Canada		
May 31, 1964	102,255	31,505
May 31, 1963	120,697	33,683
Cumulative Totals		
May 31, 1964	1,532,882	540,052
May 31, 1963	1,382,019	490,456

FREIGHT-TRAIN CARS

► *Burlington.*—Ordered 73 70-ton, 50½-ft box cars equipped with damage-reducing devices from Havelock, Neb., company shops at a unit cost of approximately $15,000. Deliveries will begin in October.

► *Canadian Pacific.*—Ordered 75 89-ft bi-level rack cars from National Steel Car at a cost of $1,650,000. The cars will be used to transport trucks from manufacturing points in Ontario to both eastern and western Canada. The CP is now taking delivery on an order for 60 tri-level auto-rack cars from National Steel Car. The tri-level order is valued a $1,350,000.

► *Pittsburgh & Lake Erie.*—Ordered 450 all-steel, 50-ft 70-ton box cars, with 10-ft wide doors from Despatch Shops, East Rochester, N.Y. The cushioned underframe cars will cost $6.2 million, and delivery will begin in the fall and be completed by the end of the year.

PASSENGER-TRAIN CARS

► *Louisville & Nashville.*—Will upgrade 30 passenger cars at its South Louisville shops as part of a continuing program to improve passenger equipment. The work will include installation of new type disc brakes on 26 coaches, three dining cars and one baggage car. New electro-mechanical air-conditioning equipment will be installed on 13 of the coaches and the baggage car.

► *New Haven.*—Is expected to submit to U.S. District Court for approval a new plan involving the leasing of new commuter cars for its New York area passenger service. The plan is the result of recent negotiations between the railroad and the State of New York, the proposed purchaser of the cars.

► *San Francisco Bay Area Rapid Transit District.*—Has awarded a $275,000 contract to Louis Allis Co. of Milwaukee, Wis., for a prototype alternating current propulsion drive system. The unit—to be ready for test car operation in early 1965—is the first solid state controlled variable speed AC traction motor drive ever built for railway use. The drive will provide up to 500 hp for each of two motors driving trucks on a single car.

NEW FACILITIES

► *Alton & Southern.*—Ordered type F inert retarders from General Railway Signal Co. for installation at its East St. Louis, Ill. yard.

► *Florida East Coast.*—Placed a $144,000 order with General Railway Signal Co. for automatic highway crossing protection equipment.

► *Northern Pacific.*—Placed a $350,000 order for CTC equipment with General Railway Signal Co. CTC will be installed between Gregory and Staples, Minn. with a Traffic Master control machine located at Minneapolis.

► *Pickands Mather & Co. Inc.*—Placed a $63,590 order with General Railway Signal Co. for CTC equipment to be installed on a 5.7-mile mine rail line in the Hoyt Lakes region of Minnesota.

► *Union Railway.*—Ordered Type F4 weight-responsive retarders and Model 6 electric switch machines from GRS, for use at the No. 2 Coal Dock in East Pittsburgh, Pa.

YOU OUGHT TO KNOW

CSS&SB vs Monon: While bigger roads get most of the attention in merger controversies in the Midwest, Chicago South Shore & South Bend and Monon continue a hassle that started earlier this year when Monon revealed it had acquired 20% of CSS&SB's stock and asked for representation in the South Shore board. CSS&SB is now charging, before the ICC, that Monon actually controls—directly or indirectly—40% of the stock. South Shore wants an investigation, followed by a divestiture order. Monon has until June 17 to reply to the charges. CSS&SB also filed a complaint in U.S. District Court June 9 seeking a restraining order to prevent Monon from adding to its holdings of South Shore stock, until the ICC rules on the legality of Monon's purchases.

Top journal performance. An all-time record of 1,249,223 car miles per hotbox setoff between division terminals was established in March 1964 by AAR member roads. Best previous month, according to figures compiled by the AAR Mechanical Division, was November 1962 when the average was 1,188,009 car miles. In March 1963 the figure was 1,074,730 car miles.

More service to Alaska: Freight service to the 49th state got a double boost when Alaska Steamship Company's converted vanship "Nadina" and Puget Sound-Alaska Van Lines' repaired Hydrotrain barge "Palmer" made their first sailings from Seattle right after Memorial Day. The "Nadina" and the similar "Tonsina" will provide weekly voyages with loads of up to 175 24-foot containers for final movement over the Alaska Railroad. The "Palmer," with a capacity of 42 railroad cars, will put PS-AVL services on a six-day basis.

C&EI fights its passenger loss: Four Chicago-Evansville, Ind., passenger trains would be discontinued under petitions filed by Chicago & Eastern Illinois with the Indiana and Illinois regulatory commissions. Two of the trains are in through service between Chicago and Jacksonville, Fla., via Louisville & Nashville and Atlantic Coast Line. If the trains are dropped, through service would be maintained—to an extent—on the "Georgian-Hummingbird." These trains operate Chicago-Evansville via C&EI, with separate Evansville-Atlanta and Evansville-New Orleans sections. On the four trains it wants to discontinue, C&EI claims losses of more than $1.3 million in 1963.

Car control pays off. Missouri Pacific's specialized-car control system is showing impressive results. For the first quarter of 1964, loads per month for the 4,000 cars covered are up to an average 1.6, against 0.9 for 1963 (and for April the load average climbed to 1.7). An additional 5,000 cars—mostly covered hoppers—will be placed under the system during June.

Bay Area car bids: Three carbuilders and an aerospace firm are collaborating with industrial designers on designs for a mock-up transit car to be submitted to the San Francisco BARTD. St. Louis Car, Budd, and Pullman-Standard are teamed up with Sundberg-Ferar, Eliot Noyes and William Schmidt, respectively; Convair is assembling a design group to make its own entry. BARTD will decide on the mock-up design within a few weeks.

Michigan gets tourist attraction: The Pennsylvania's 21-mile Missaukee branch is embarking on a new career as a Michigan tourist attraction. The ICC has approved acquisition of the line between Missaukee Junction, Mich., and Falmouth, including its branch to Lake City, by the new Cadillac & Lake City Railway Company. The action came after PRR filed an abandonment application. The new owner will have a steam locomotive and operate "primarily as a tourist attraction," the Commission's report said.

RI Motor Transit expands: In the wake of an ICC decision, the Rock Island Motor Transit Company has extended its interstate operations to serve an additional 87 communities. RIMT is now authorized to operate as a full-fledged common motor carrier, with key point restrictions lifted.

Current statistics

Net income, estimated	
3 mos., 1964	$144,000,000
3 mos., 1963	84,000,000
Carloadings, revenue freight	
23 wks., 1964	12,489,712
23 wks., 1963	12,384,288
Freight cars on order	
May 1, 1964	34,702
May 1, 1963	19,869
Freight cars delivered	
4 mos., 1964	23,829
4 mos., 1963	13,300
Serviceable cars	
May 1, 1964	1,409,716
May 1, 1963	1,412,847

Computers and the paperwork explosion

Mechanization will revolutionize railroad accounting and financial practices in the years ahead, AAR Accounting Division members believe. But a good man will still be hard to find.

Railroading will take more paperwork—and more meaningful paperwork—than ever before in the years ahead. It will be more useful paperwork—and possibly less expensive—but it will increase as rail officers learn to use fully the computers that are mechanizing record and report work.

There will be even greater demands upon accountants and financial officers to have the paperwork serve more management purposes. These demands, in turn, are increasing the pressure for trained manpower—in the face of shortages of such manpower—and also adding to the pressure for even more mechanization.

● **Over-all needs probed.** Top accounting and financial officers met at St. Louis earlier this month for the 69th annual meeting of the Association of American Railroads' Accounting Division—and did some community worrying about the rapidly changing railroad manpower-management-mechanization scene. What the men in charge of what one speaker called the railroads' "paperwork factories" see is nothing less than a revolution in the thinking and practices that have traditionally dominated accounting and financial work on U.S. railroads.

● **Manpower management.** John C. Lorini, vice president of Booz, Allen & Hamilton, Inc., said the railroads are almost unique, being faced with a situation where they want to attract new blood but have a decreasing need for people in general.

In the face of an employee population that is aging, the railroad industry, said Mr. Lorini, "will be faced with an increasing need to take firm steps that will establish a sound age distribution and thus provide the raw materials to meet future needs for supervisors and managers."

● **Wrong motivation.** The railroad paperwork forces are not strongly motivated to excel, he noted. Because of industry pressure to reduce expenses, the urge to excel has been replaced by a "survival" motivation that is devastating to carriers attempting to effect improvements. Union restrictions, seniority practices and other factors impede railroad manpower selection and placement on the basis of merit.

Mr. Lorini recommended to Accounting Division members a total audit of carrier manpower environment, a master plan encompassing objectives, estimates of future needs and timetables for the programs through which carriers can implement needed changes.

● **Management-accounting link.** J. J. McIntyre, partner, Price, Waterhouse & Co., pointed out major fundamental changes affecting the general area of accounting and its relation to railroad management over the past 20 years: "The rapidly increasing complexity of industrial activity and growth, the emphasis on profit strategy, and the development of electronic tools and other sophisticated management tools, has rewritten the theory of management to include a position which may best be described as a 'management accountant.' Accounting has moved from the position of a tool of management to that of an indispensable part of the management process." The accounting function, he said, "must influence management to make better decisions or it makes no contribution" and will not be highly regarded: "A challenging, dominant role for accounting has been born out of the need created by the complexity of today's management job."

● **People obsolete?** Rejecting the idea that computers will make any inroads on the capability of accounting officers for making meaningful decisions, Mr. McIntyre pointed out that accountants should not be worried about being replaced by a computer: "If anything, accountants should worry about being replaced by another accountant who understands computers." He told the accounting financial officers that a great deficiency in adequately trained accounting personnel lies ahead. With industry needs for trained accounting people far outstripping college production of accountants, he advised Accounting Division members to formu-

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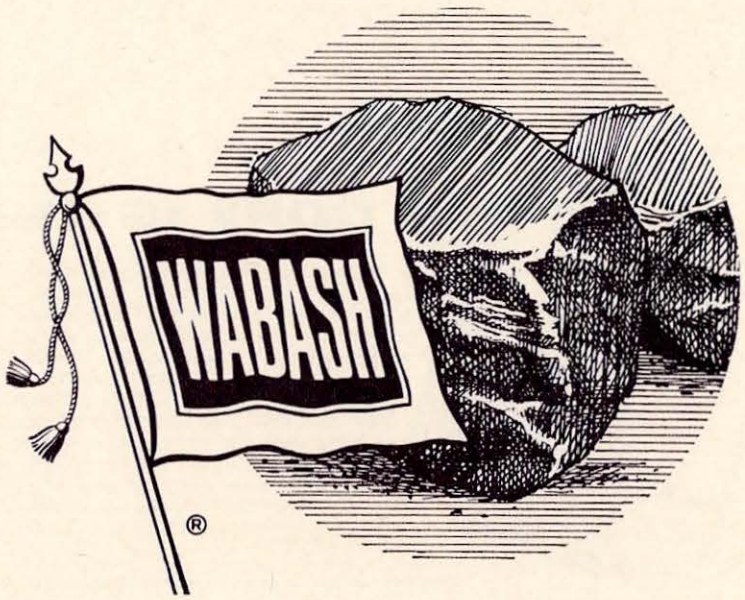

late programs and to get into college recruitment as quickly as possible, on a regular and sustained basis.

R. C. McGowan, assistant vice president, finance department, Baltimore & Ohio, outlined the opportunities ahead for accounting and financial departments of railroads because of the ever-increasing use and improvement of computers.

• **Better financial control.** Mr. McGowan described the principal capabilities of modern data-processing machines which make them useful as tools in establishing better systems of accounting and financial control.

— Speed is increasing every day: "Our data processing folks talk in terms of magnetic tape units that read at an average rate of 170,000 characters per second. Economics have shifted to the point where it is no longer necessary to be overly cautious in deciding whether it is too costly to capture raw data and to perform an operation on the computer as opposed to doing it manually. Today we can afford to do things with data-processing systems which a year or two ago might have been too costly to be practical—and five or ten years ago would not even have been dreamed of."

The mechanical memory

— Capacity of modern computers to capture, retain and manipulate masses of data, quickly and at relatively low cost, is another fact transforming accounting and financial work: "With the ability to store up to eight million characters in the high-speed memory of a computer, more than 50 million characters on a reel of magnetic tape, and billions of characters in auxiliary memory devices, we can afford to create a reservoir of basic financial and operating information about the company. Here again, the economics have changed radically to the point where we can conceive of capturing and storing information about the business which only a short time ago would have been too costly and too time-consuming."

— Computer ability to select, analyze, summarize and compare information—and to do this quickly and at relatively low cost—is another great aid in formulation of management-oriented reports, in "distilling data from information reservoirs for managements' use."

— An additional capability of the modern computers is in present mastery of increasingly sophisticated mathematical and scientific techniques to the solution of complex railroad problems: "We can apply mathematical formulas in recurring analysis which in the past would have been too time-consuming and costly to consider. The whole area of operations and simulation have been opened up. Operations research is a particularly valuable technique since it is dedicated to discovering how to optimize the allocation and use of resources."

• **Computers are economic.** Noting that today's data-processing systems are enabling the carriers to do many tasks at substantially lower cost than before, Mr. McGowan pointed out that the capabilities of modern computer equipment for needle-sharp management backing are almost endless—and that it is up to the accounting and financial officers to translate this capability into reality.

New York Central Comptroller R. E. Kappauf was elected Accounting Division chairman, succeeding Y. D. Lott, vice president and comptroller of the Gulf, Mobile & Ohio. R. M. Sutton, vice president and comptroller of the Union Pacific, was elected first vice chairman, and W. V. Laurence, vice president of Seaboard Air Line, was elected second vice chairman.

Current Publications

NEW GUIDE TO MORE EFFECTIVE WRITING IN BUSINESS AND INDUSTRY, by Robert Gunning. 350 pages. Industrial Education Institute, 221 Columbus Ave., Boston, Mass. 02116. $12.50.

PERSPECTIVES IN TRANSPORTATION, edited by Karl M. Ruppenthal. From the 1962 sessions of the Transportation Management Program and the 17th annual forum of the National Defense Transportation Association. 157 pages. Stanford University, Graduate School of Business, Stanford, Cal. $5.75.

Dividends Declared

ALLEGHENY & WESTERN.—$3, semiannual, payable July 1 to holders of record June 19.

ATCHISON, TOPEKA & SANTA FE.—25¢, semiannual, payable Aug. 1 to holders of record June 26.

BEECH CREEK.—50¢, quarterly, payable July 1 to holders of record June 15.

DELAWARE & HUDSON.—30¢, payable June 27 to holders of record June 10.

DENVER & RIO GRANDE WESTERN.—25¢, payable June 15 to holders of record June 5.

ERIE & PITTSBURGH.—87½¢, quarterly, paid June 10 to holders of record May 29.

ILLINOIS CENTRAL.—50¢, quarterly payable July 1 to holders of record June 1.

MISSOURI PACIFIC.—Class A, $1, payable June 30 to holders of record June 12.

NORTHERN PACIFIC.—60¢, payable July 31 to holders of record July 10.

PITTSBURGH, FORT WAYNE & CHICAGO.—$1.75, quarterly, payable July 7 to holders of record June 10.

RICHMOND, FREDERICKSBURG & POTOMAC.—$1.25, quarterly, payable July 3 to holders of record June 19.

SEABOARD AIR LINE.—40¢, quarterly, payable June 26 to holders of record June 12.

SOUTHERN PACIFIC.—35¢, quarterly, payable June 22 to holders of record June 1.

UNITED NEW JERSEY RR & CANAL.—$2.50, quarterly, payable July 10 to holders of record June 19.

WESTERN MARYLAND.—common, 25¢, quarterly; 4% Preferred, 40¢, quarterly, both payable June 30 to holders of record June 16.

WHEELING & LAKE ERIE.—Prior Lien, $1; common, $1.4375, both payable Aug. 1 to holders of record July 10.

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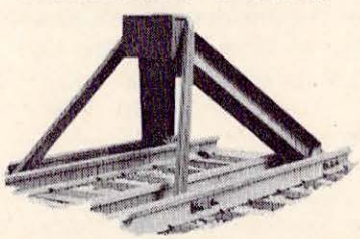

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Making capital more efficient

How can access to capital for desirable improvements be equalized for all modes of transport? Equitable taxes would help.

One of the great opportunities (or necessities) confronting the railroads today is the achievement of greater efficiency in the use of costly plant, both equipment and fixed facilities. A freight car used to cost $2,000 and now it costs five or ten times as much. The only possible way of offsetting the increased daily cost of owning (or leasing) a freight car is to get more daily ton-miles of revenue freight movement out of it. Progress is being made in this direction, but no one would contend that there isn't still a lot of room for improvement.

Railroad mergers are one way of attaining greater efficiency in the utilization of freight cars—for example, by reducing the necessary interchanges of freight between railroads. Such interchanges occasion moderately increased operating expenses. They also tend to reduce daily revenue-miles per car.

Mergers, of course, help to increase efficiency in the use of invested capital in other areas besides that of freight car equipment. For instance, where merged companies have parallel lines, the bulk of the tonnage may be routed over the more efficient line—either abandoning the less efficient one or relegating it to secondary status. In either case there is a reduction in capital and maintenance cost in relation to tonnage handled.

Railroads also increase their efficiency in the use of their plant when they withdraw or minimize the provision of lightly patronized less-than-carload or passenger service. People don't use a power shovel to cultivate the family vegetable garden. Neither do alert managements use a locomotive and a crew of five or six men to peddle merchandise freight at local stations—which was standard practice a generation ago.

The public interest in getting adequate transportation at lowest possible expense requires that railroads concentrate their efforts on transportation tasks that they can perform economically. This does not mean, of course, that every service that isn't presently profitable should be abandoned. If there's reason to expect that losers can be turned into earners, they should be given a chance to prove themselves.

The growing importance of skilled management of finances has been recognized by leading railroads, in the strengthening of their financial departments—an area where the employment of the best available abilities is seldom regretted. The railroads have a complex financial and competitive problem to contend with—in the way their fixed plant investment is financed, compared to the practices of air, highway and waterway transportation. For example, a railroad is built from A to B and—after the passage of time—the line becomes a loser and has to be discontinued, with continuing costs which the railroad must seek to collect from its remunerative traffic.

If, on the other hand, a highway or waterway between A and B is constructed and later abandoned—it is the public treasury, not other highway or waterway traffic, that usually has to assume the loss. You seldom find water, air or highway carriers that are willing to accept the risk of financing fixed plant improvements through private investments. If they cannot secure the facilities they need by direct public expenditure, then some "authority" is set up to do the job. These authorities are usually self-supporting—but are also, largely, tax-exempt as to both their property and their securities. Consequently, they have found it easy to raise hundreds of millions of dollars for capital improvements for transportation modes that compete with the railroads.

Easy for some, hard for others

It is mighty hard to keep railroad fixed plant as fully up-to-date as parallel plant of rival modes, so long as investment in railroad improvements is discriminated against as it is.

There must be some way whereby access to capital for railroad improvements can be more nearly equalized with that accorded to other modes of transportation—and without running the risk of socializing the railroads. In an article in the spring 1964 issue of the Transportation Journal (organ of the American Society of Traffic and Transportation) Professor C. H. Whitehurst, Jr., of Clemson College tentatively suggests that railroads might in many cases be justifiably exempt from property taxation to the degree that their rivals are.

Back in the early days of railroading, state and local governments frequently aided in the financing of railroad construction (receiving securities in return). Some of these investments resulted in losses, but others were highly remunerative and remain so to this day—and they did not result in socialization of the railroads.

Maximum efficiency in the use of capital for transportation purposes should be an over-all goal of all framers of transportation policy. Managements can work toward this goal internally (e.g., by more efficient handling of freight cars and by economies attained through mergers). But full achievement of maximum transportation economy can come only if access of railroads to investment capital is equalized with that enjoyed by other transportation modes.

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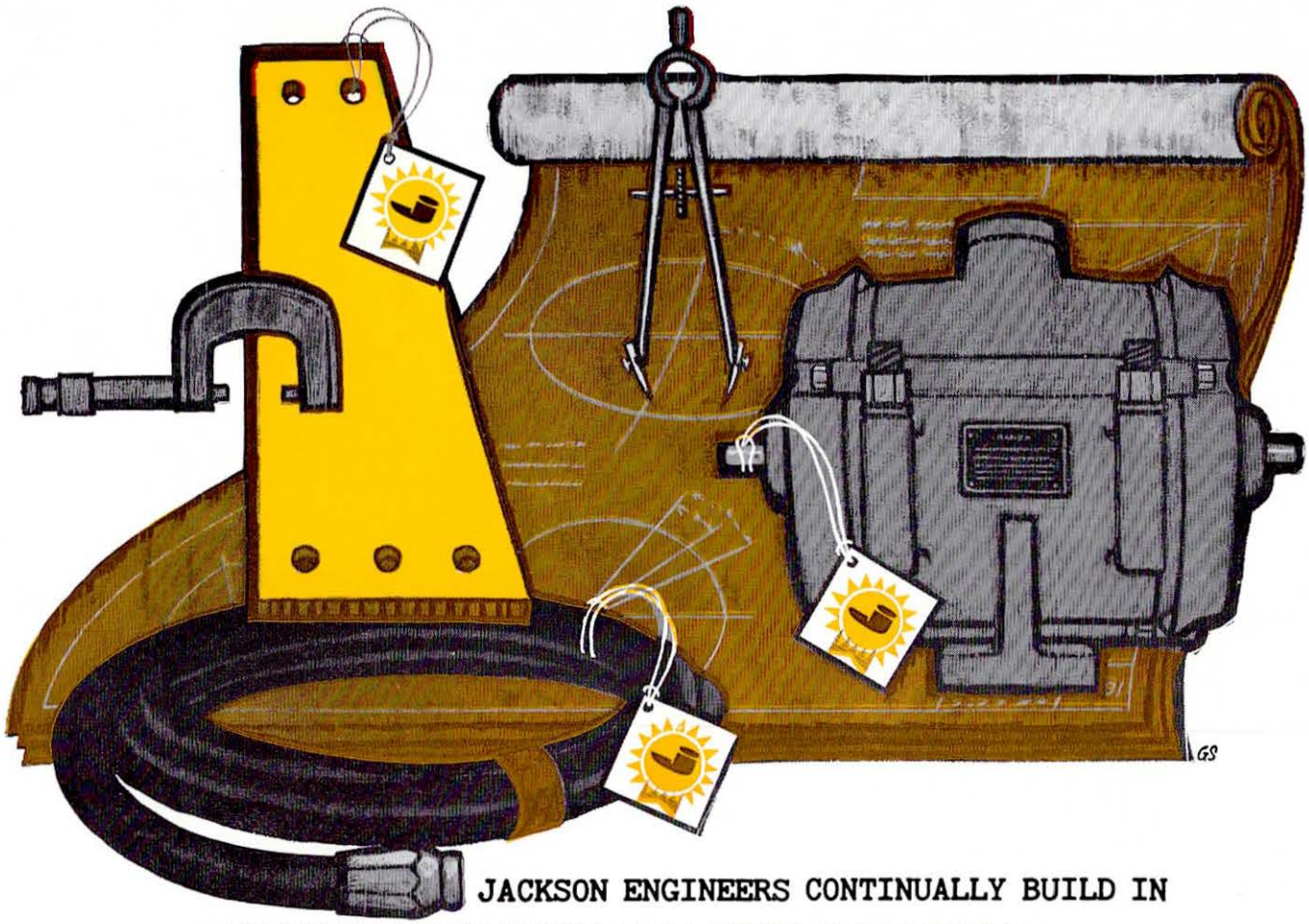

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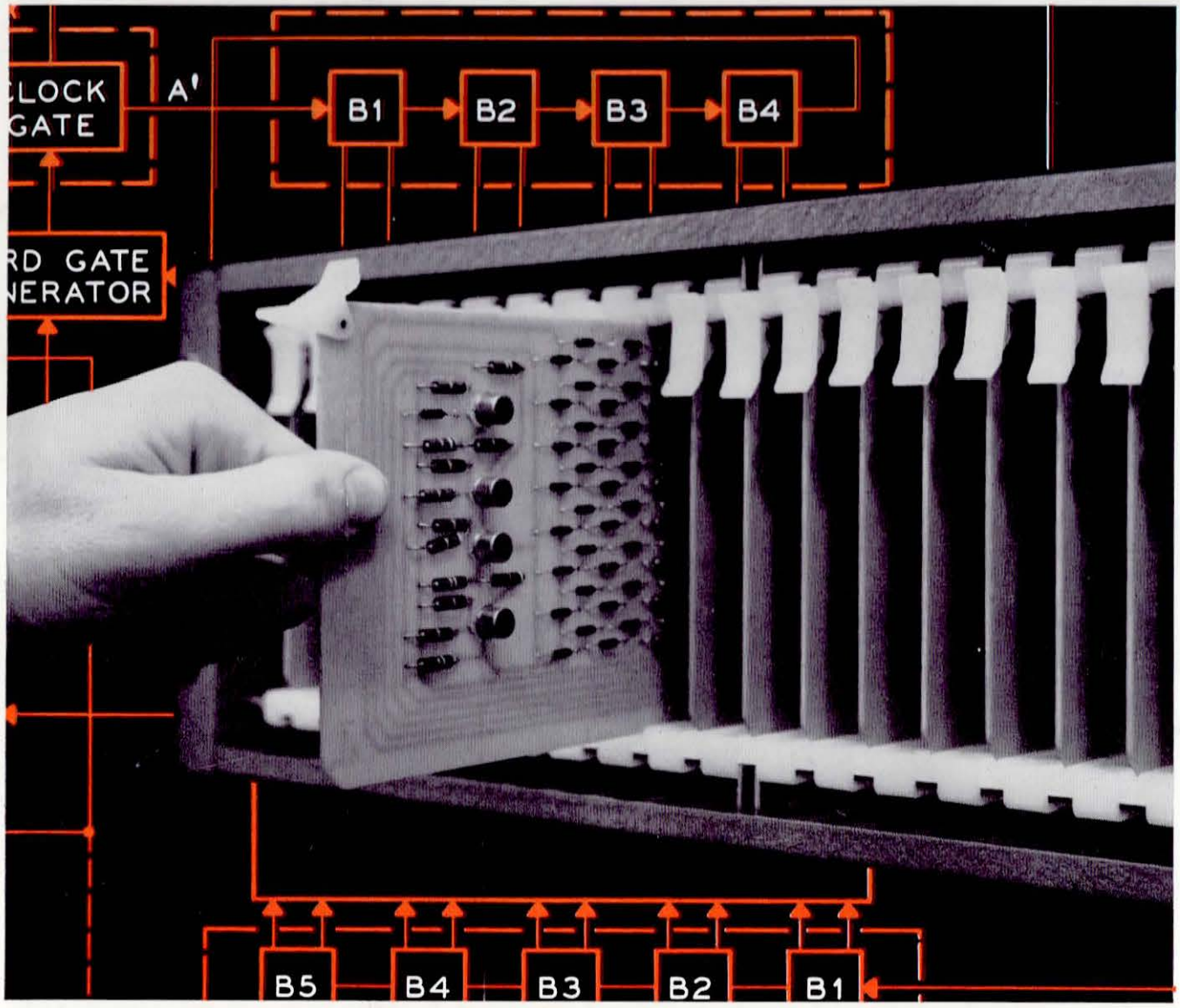

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